



**Indiana Vocational  
Technical College  
1985-86 Catalog**

# TENTATIVE COLLEGE CALENDAR 1985-86

## SUMMER 1985\*

May 21	Classes Begin
May 27	Memorial Day
July 4	Independence Day
August 7	Classes End

## FALL 1985

August 28	Classes Begin
September 2	Labor Day
November 13	Classes End

## WINTER 1985-86

November 21	Classes Begin
November 28-29	Thanksgiving Holiday
December 23 - January 3, 1986	Winter Break
February 22	Classes End

## SPRING 1986

March 3	Classes Begin
May 16	Classes End

# TENTATIVE COLLEGE CALENDAR 1986-87

## SUMMER 1986\*

May 23	Classes Begin
May 26	Memorial Day
July 4	Independence Day
August 11	Classes End

## FALL 1986

September 2	Classes begin
November 17	Classes End

## WINTER 1986-87

November 24	Classes Begin
November 27-28	Thanksgiving Holiday
December 19 - January 1, 1986	Winter Break
February 24	Classes End

## SPRING 1987

March 3	Classes Begin
May 18	Classes End

\* Summer quarter will include a break period at a time to be established by each regional campus. Beginning and ending dates of summer quarter may also vary according to region. Contact your regional center for further information.

# **INDIANA VOCATIONAL TECHNICAL COLLEGE**

**1985-1986 Catalog**

**Indiana Vocational Technical College is an accredited state-supported  
educational institution.**

Ivy Tech Office of Information Services  
P.O. Box 1763, Indianapolis, IN 46206  
Caroline Card Wendt, Editor  
Rodney Lomax, Photographer

## Nondiscrimination Policy Equal Opportunity/Affirmative Action Program

Indiana Vocational Technical College seeks to develop degree credit programs, courses, and community service offerings and to provide open admission, counseling, and placement service for all persons, regardless of race, color, creed, religion, sex, national origin, physical or mental handicap, age, or veteran status. The College strives continually to eliminate the conditions from which discrimination springs.

The education programs, courses, descriptions of courses, regulations, and fees shown in this catalog are effective Fall Quarter 1985-86. This publication and its provisions are not in any way a contract between the student and Indiana Vocational Technical College. The College reserves the right to revise any section or requirement at any time.

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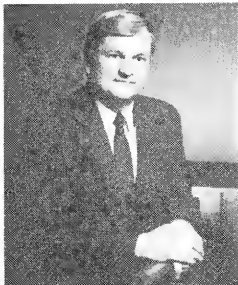
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# MESSAGE FROM THE PRESIDENT

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Indiana Vocational Technical College is an exciting, growing institution! The College currently enrolls more than 52,000 men and women annually who choose to improve their job skills and employment potential through technical education programs at the College. Courses and programs of study are offered in applied sciences and technologies, business and information systems, visual communications, and human services and health occupations.

Ivy Tech, as we are popularly known, is the only accredited Indiana college or university legislatively mandated to provide statewide post-secondary vocational technical education. The College understands and is proud of this mission "to match job opportunities with job skills."

Ivy Tech utilizes Indiana as its campus through a network of 13 regions. Within each of these regional areas, instruction is offered at many convenient sites during the day and evening so that students may attend more easily.

The variety in Ivy Tech's instructional programming encourages persons to prepare for initial employment or job upgrade. The College's continuing instructional emphasis on new or expanding industrial and business equipment and processes helps provide the Ivy Tech student with the skills demanded today in the "real world" of work in Indiana. You are welcome to come to Ivy Tech and enroll for a few courses or a full two-year degree program.

Ivy Tech is well-known and respected for its one and two year credit programs. Of importance to the people in the business communities, however, are the hundreds of short-term, custom-designed, packaged programs offered to meet immediate needs. For the latest information on these unique programs, I ask that you contact the Director of Industrial Training at the nearest Ivy Tech Center.

As you examine this catalog, we invite you to share our pride and enthusiasm about the educational offerings and student services available at Ivy Tech. Please contact the Ivy Tech regional center closest to you for additional information. The centers are listed on the next page.

Gerald I. Lamkin, President

# REGIONAL ADMINISTRATIVE CENTERS

## **IVY TECH NORTHWEST,**

### **Region 1**

1440 East 35th Avenue  
Gary, Indiana 46409  
Phone 219/981-1111

## **IVY TECH NORTHCENTRAL,**

### **Region 2**

1534 West Sample Street  
South Bend, Indiana 46619  
Phone 219/289-7001

## **IVY TECH NORTHEAST,**

### **Region 3**

3800 North Anthony Boulevard  
Fort Wayne, Indiana 46805  
Phone 219/482-9171

## **IVY TECH LAFAYETTE,**

### **Region 4**

3208 Ross Road  
P.O. Box 6299  
Lafayette, Indiana 47903  
Phone 317/477-7401

## **IVY TECH KOKOMO,**

### **Region 5**

1815 East Morgan Street  
Kokomo, Indiana 46901  
Phone 317/459-0561

## **IVY TECH EASTCENTRAL,**

### **Region 6**

4100 Cowan Road  
P.O. Box 3100  
Muncie, Indiana 47302  
Phone 317/289-2291

## **IVY TECH WABASH VALLEY,**

### **Region 7**

7377 S. Dixie Bee Road  
Terre Haute, Indiana 47802  
Phone 812/299-1121

## **IVY TECH CENTRAL INDIANA,**

### **Region 8**

One West 26th Street  
P.O. Box 1763  
Indianapolis, Indiana 46206  
Phone 317/929-4882

## **IVY TECH WHITEWATER,**

### **Region 9**

2325 Chester Boulevard  
Richmond, Indiana 47374  
Phone 317/966-2656

## **IVY TECH COLUMBUS,**

### **Region 10**

4475 Central Avenue  
Columbus, Indiana 47203  
Phone 812/372-9925

## **IVY TECH SOUTHEAST,**

### **Region 11**

Highway 62 and Ivy Tech Drive  
Madison, Indiana 47250  
Phone 812/265-2580

## **IVY TECH SOUTHWEST,**

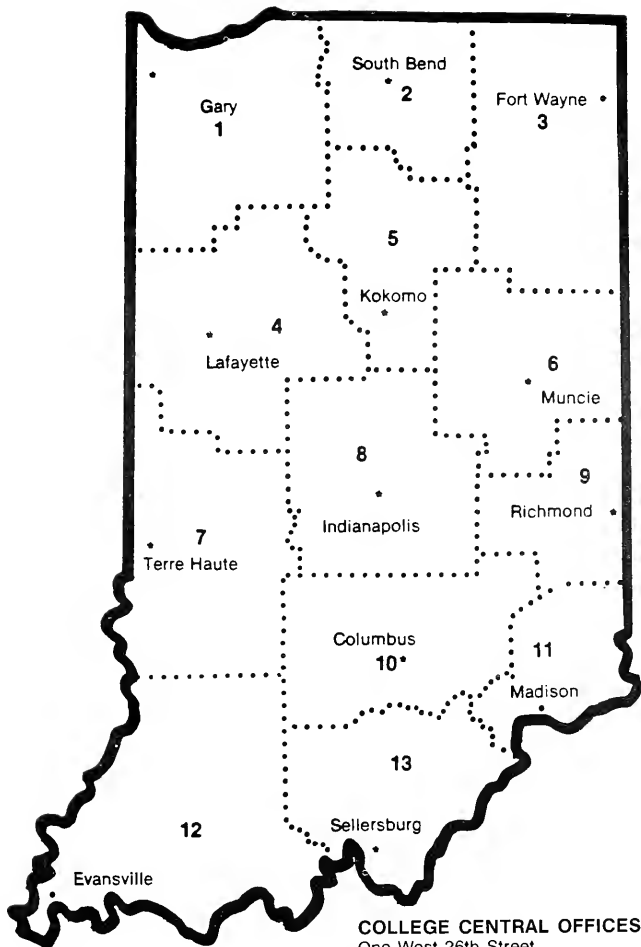
### **Region 12**

3501 First Avenue  
Evansville, Indiana 47710  
Phone 812/426-2865

## **IVY TECH SOUTHCENTRAL,**

### **Region 13**

8204 Highway 311  
Sellersburg, Indiana 47172  
Phone 812/246-3301

**COLLEGE CENTRAL OFFICES**

One West 26th Street  
P.O. Box 1763  
Indianapolis, Indiana 46206  
Phone 317/929-4882

# STATE BOARD OF TRUSTEES

---

Mr. Jess F. Helsel

Mr. R. James Miller

Mr. Donald H. Heckard

Mr. Robert E. Schumann

Ms. Marsha M. Oliver

Mr. Wendell D. Vandivier

Mr. John V. Barnett

Mrs. Philip T. Warner

Mr. Gilbert E. Betulius

Mrs. Shirley Woody

Mr. V. William Hunt

Indiana Vocational Technical College  
One West 26th Street, P.O. Box 1763  
Indianapolis, IN 46206

January 1985

# COLLEGE ADMINISTRATIVE OFFICERS

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Gerald I. Lamkin  
President

Thomas H. Taylor  
Vice President/Treasurer  
College Central Offices

Dr. Norman W. Sievert  
Vice President/Educational Services  
College Central Offices

Mearle R. Donica  
Vice President/Dean  
Region 1 - Northwest

Samuel E. Borden  
Vice President/Dean  
Region 7 - Wabash Valley

Dr. Carl F. Lutz  
Vice President/Dean  
Region 2 - Northcentral

Dr. Meredith L. Carter  
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Region 8 - Central Indiana

Jon L. Rupright  
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Region 3 - Northeast

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Dr. Thomas E. Reckerd  
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Region 4 - Lafayette

Harvey S. Poling  
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Region 10 - Columbus

Charles E. Hetley  
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Region 5 - Kokomo

Homer B. Smith  
Vice President/Dean  
Region 11 - Southeast

Richard L. Davidson  
Vice President/Dean  
Region 6 - Eastcentral

Dr. H. Victor Baldi  
Vice President/Dean  
Region 12 - Southwest

Carl F. Scott  
Vice President/Dean  
Region 13 - Southcentral

# COLLEGE PROFILE

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## HISTORY OF THE COLLEGE

Indiana Vocational Technical College, popularly known as Ivy Tech, was established in 1963 by the Indiana General Assembly as Indiana's first statewide vocational-technical college. The legislature appropriated \$50,000 at that time for development of the College. Following appointment of a State Board of Trustees, a director was named and the first training program established in 1965. Later amendments to the enabling legislation authorized Ivy Tech's present regional structure of thirteen administrative centers, designed to provide accessible technical training to all citizens of Indiana. Between 1966 and 1969 thirteen regional boards of trustees were appointed and thirteen regions chartered.

The College has shown impressive growth in the relatively short period of its existence. Enrollment increased from 3,233 students in the fall quarter of 1968 to 27,692 in the same period of 1984. Operating budgets have also increased during these years. In 1965 the General Assembly appropriated \$2,800,000 for Ivy Tech's first operating budget; in 1984-85 it appropriated \$29 million as part of Ivy Tech's total operating budget of \$47 million.

## MISSION OF THE COLLEGE

The mission of Ivy Tech is stated in the authorizing legislation: "There shall be, and hereby is created and established, a new state post-high school educational institution to be devoted primarily to occupational training of a practical, technical, and semitechnical nature for the citizens of Indiana."

Ivy Tech's mission was broadened in 1971 with the added authority to grant diplomas or certificates, including the one-year Technical Certificate and the two-year Associate in Applied Science degree, to students completing prescribed and authorized courses or series of

courses. Furthermore, the College was granted permission to offer academic courses for the vocational-technical education of the people in the region.

Ivy Tech accepts its mandate to serve the following target population groups:

- (1) students who have not graduated from high school;
- (2) high school graduates interested in continuing their education in a vocational-technical type institution with programs of shorter duration than a four-year college program;
- (3) students who have not completed college work;
- (4) college graduates interested in supplementing their education with vocational-technical training;
- (5) adults needing and desiring retraining or additional training in a vocational-technical specialty.

## **GOALS OF THE COLLEGE**

Ivy Tech adheres to the belief that each individual, regardless of economic or social status, should be provided opportunities to obtain relevant, occupation-oriented education and training. General and technical classes are combined to develop self-awareness and to prepare students to compete successfully in chosen occupations. Accordingly, Ivy Tech has established the following goals:

1. The College will offer occupation-oriented continuing education and training consistent with the economic development needs of interested groups in the state of Indiana.
2. The College will offer a wide range of meaningful occupation-oriented programs with multiple entry and exit opportunities in a continuum of education and training consistent with the individual student's interests, needs, and abilities.
3. The College will strive to provide the opportunity for citizens of the state to enroll in the College regardless of their financial resources or geographic location.
4. The College will provide the opportunity for each applicant to gain occupational competence regardless of age, race, sex, or religious affiliation.
5. The College will encourage understanding, acceptance, and support for occupation-based education and training throughout the state of Indiana and will communicate the valuable contribution it makes to the individual, community, state, and nation.
6. The College will provide educational and training experiences supportive of the individual student's social, cultural,

and personal development within each occupational program offering.

7. The College will use its resources prudently to implement its legislature-mandated mission.
8. The College will cooperate with other providers of occupation-oriented training and education in all educational sectors.
9. The College will continue to develop a dynamic occupation-based delivery system capable of adapting its offerings to the changing technological and socioeconomic needs of the community, state, and nation.
10. The College will offer relevant, occupation-oriented, post-secondary education and training to develop students to the desired level of competence consistent with the manpower needs of the state of Indiana.

Steadfast adherence to its mission and goals, together with strong support and encouragement from state and community leaders, have made possible Ivy Tech's outstanding achievements in a relatively short period.

## **FACULTY**

In the Fall Quarter 1984, the College employed 435 full-time and 1,270 part-time faculty. The faculty members have extensive practical work experience in their fields of instruction. Part-time instructors are regularly employed in their fields, and many of the full-time instructors remain active in their professions. Some of the faculty members are authors of textbooks on their specialties.

Since College instructors are active in their fields, they bring to the Ivy Tech classroom and laboratory their knowledge of current technology, methods, and techniques. The use of a large, part-time faculty also allows the College greater flexibility in scheduling classes in daytime, evening, and weekend hours.

## **FACILITIES**

Many types of facilities are used as instructional sites. All thirteen regions of the College have major regional centers. Classes are offered throughout the state in 178 buildings.



# IVY TECH FOUNDATION

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The Ivy Tech Foundation is a nonprofit, tax-exempt organization, dedicated to serving the purposes and functions of Indiana Vocational Technical College. The Foundation promotes educational, scientific, and charitable functions in connection with or at the request of the College. The Foundation also serves as an important communications link between the academic community and Indiana businesses and industries.

The Foundation, incorporated in 1969, has contributed greatly to the statewide growth and development of the College. It was instrumental in providing property and facilities for the initial development of many of the regional Institutes, and it continues to devote its resources to the improvement and enrichment of the College facilities, instruction, and services.

The Foundation also serves Ivy Tech students through its scholarship programs. In 1983-84, the Foundation provided \$69,315 in scholarship monies to enable students to enroll in classes. Contributions to the Ivy Tech Foundation—large and small—are pooled for this purpose.

The Foundation receives and administers gifts, grants, bequests, equipment donations, contracts, and patents on behalf of the College.

# COLLEGE INFORMATION AND SERVICES

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## ADMISSIONS

### General Admissions-Non-Degree Objective

Ivy Tech offers courses in many special interest areas, including college preparation. For those who plan to take the GED test, the College offers GED preparation. Persons interested in taking any of the numerous Ivy Tech courses are invited to do so. Admission as a non-degree student is quick and easy.

### General Admissions-Degree Objective

For admission as a regular student to one of Ivy Tech's programs leading to an Associate Degree or Technical Certificate, the normal requirement is a high school diploma, GED Certificate, or demonstrated high school equivalency. The Office of Student Services will

assist the student, on request, in obtaining an official copy of the diploma or GED Certificate, which must be issued from the previously attended institution.

Applicants who are not recent high school graduates are advised to participate in assessment testing.\* The purposes of the testing are to measure the student's ability to benefit from a selected program and to determine the student's appropriate placement in Ivy Tech courses. A fee may be charged to cover the cost of administering some of the tests and assessments. Admission standards will be satisfied if the assessment testing reveals that the applicant has the basic skills needed for success in the chosen program. If the tests reveal skill deficiencies, the applicant will be advised to complete appropriate developmental coursework, as defined by the Director of Instruction, before entering the program. Students may or may not be eligible for financial aid during this period. If the tests indicate that the applicant is unlikely to benefit from Ivy Tech training at that time, he or she will be referred to an appropriate community resource offering the needed assistance. The applicant will be welcome to enter the admissions process at Ivy Tech again at a later date.

Applicants seeking admission to certain health occupation programs may be requested to participate in specific pre-enrollment assessments or interviews to fulfill College or external agency requirements. In addition, certain prerequisites, such as health examinations, may have to be satisfied prior to enrollment in particular programs or courses.

The College reserves the right to guide the enrollment of students in particular programs or courses on the basis of their prior academic records, vocational counseling, and testing.

Students who leave the College can request readmission at a later date. The student whose course of study at Ivy Tech has been interrupted should notify the Office of Student Services in advance of registration.

\*Testing may be waived if the applicant submits either:

- a. an official transcript from an accredited post-secondary institution indicating achievement consistent with Ivy Tech's admission standards;
- b. acceptable standardized test scores (i.e., SAT, ACT).

## **Limited Admission and Enrollment**

The number of students admitted and enrolled in programs and/or courses may be limited by College financial resources, facilities—

including available lab equipment and related support, or the number of available health program clinical work stations.

Some programs have prerequisites or entrance requirements based on skill levels and prior knowledge. Certain programs may require a completed health examination form signed by a medical doctor.

### **Admission Procedures and Support Documents - Non-Degree Objective**

1. The College requests that the student establish a record by completing the Student Information Data Form for Admissions.

### **Admission Procedures and Support Documents-Degree Objective**

1. The College requests all students to complete the Student Admission Data Form, which establishes their records in the Admissions Office.
2. Proof of high school graduation or GED completion is normally required for admission into a program leading to a certificate or a degree. The high school graduate or GED completer should request the secondary school to send an official copy of the transcript to the admissions office.
3. The College may request the student to talk with a College counselor, who will assist in selecting a course of study that will be of maximum benefit to the student.
4. To transfer credits to Ivy Tech from another college or similar post-secondary institution previously attended, the student is requested to forward an official copy of the grade transcript or other document from that institution to Ivy Tech.
5. The College requires a health examination for certain health occupations.

Students currently attending high school may attend Ivy Tech with the written permission of an official of the high school.



## **Transfer Students**

Students admitted from other recognized colleges and universities may be awarded credit at Ivy Tech for completed courses that apply to the chosen program of study. In addition to meeting the general admission requirements, these students should present an official transcript from the institution previously attended.

The College reserves the right to refuse admission or to accept conditionally those students who have been dismissed for disciplinary reasons from other colleges or universities, including other regions of Ivy Tech.

## **International Students**

Ivy Tech welcomes qualified students from other countries and seeks to make their educational experiences pleasant and rewarding. International students must meet the College admission requirements and certain other requirements.

The international student must also provide proof of adequate financial support. It is estimated that for the 1985-86 academic year the foreign student will need a minimum of \$8,500 for fees and living expenses while attending the College. The international student should submit a letter from an appropriate sponsor, government official, or bank official stating that sufficient funds are available to cover the cost of the student's education and that these funds will be available to the student while attending college in this country.

The Office of Student Services will provide further information and assistance upon request.

## **Handicapped Students**

College programs and facilities are accessible to handicapped students. Each regional institute has designated parking and special restroom facilities for the physically handicapped. Support services are also available to aid handicapped students with career planning, financial aid, personal counseling, and placement. The College staff works with the Department of Vocational Rehabilitation and other service agencies to assist physically and psychologically impaired students through available local community resources.

Students with handicaps are urged to contact the Student Services Office for help with their special challenges as students at Ivy Tech.

## **STUDENT ORIENTATION**

All new degree students are encouraged to participate in an orientation program prior to or during the first week of classes. The purpose of the orientation is to assist students in making the transition to the College environment. Topics discussed include student services, financial aid, business services, instructional programs, and College activities, policies and procedures. If not previously completed, the orientation program may also include testing, interviews, evaluations, counseling, program advising, determination of advanced standing status, and scheduling of classes.

## **CAREER COUNSELING**

The Office of Student Services in each region offers counseling to all interested students. Students may obtain individual counseling and/or assessment to assist them in identifying their abilities or occupational interests. Counseling and assessments are also helpful in developing realistic education and career plans and occupational outlook data. A computerized career guidance system (TEDS) is available in each regional Office of Student Services. Students are encouraged to seek assistance in selecting an occupation and the necessary training by contacting Student Services.

In addition to the counseling program offered by the Office of Student Services, the College utilizes a faculty advisor system. On admission, each degree student is assigned a faculty advisor, whose purpose is to

1. assist the student in course selection and program planning;
2. guide the student in meeting the requirements for graduation as prescribed by the College;

3. insure that appropriate technical and general education electives are included in the chosen course of study.

The College encourages close cooperation among students, faculty, and staff. Though some counseling is available on an unscheduled basis, students are encouraged to schedule appointments with counselors in advance.

## **TEST-OUT PROCEDURES**

Policies regarding testing out of classes vary from program to program. The student who wishes to test out of a class should contact the program advisor before registering for the class. A fee may be charged for the tests.

The general guidelines for test-out are as follows:

1. Test-out examinations should be taken before registering for the class for which the test-out is attempted.
2. Test-out examinations should be taken and completed at one sitting (unless the test is offered in two parts, i.e., lab and written exams).
3. Test-out examinations for specific courses are normally attempted only once.
4. Test-out credits are not included in credit computations for financial aid programs.

## **REGISTRATION PROCEDURES**

The registration process includes program counseling, selection of courses, and payment of fees. Newly admitted students will be notified as to when to register for their first quarter classes.

Specified days are set aside for registration prior to each quarter. Students are advised to seek assistance in course selection from faculty advisors or counselors in the Office of Student Services before registering for classes.

Please contact the Student Services Office of the Ivy Tech region you wish to attend for information concerning registration procedures.

NOTE: Students are not registered until fees have been satisfied.

### **Late Registration**

Registration on or after the first day of classes each quarter is considered late. Late registration is permitted during the first week of classes, and a \$10 late registration fee may be assessed. After the first week of classes, registrations will be processed with appropriate

approval. For further information, please contact the Office of Student Services.

## **Drop-and-Add**

Courses may be dropped or added during the first three weeks of classes. Dropped courses do not appear on the student's record, and the student is eligible for a full or partial refund of the assessed fees. (See Refund Policy.) Courses are not officially dropped until the necessary forms have been completed and returned to the Office of Student Services.

## **Withdrawal**

From the beginning of the fourth week to the course midpoint, a student may withdraw from a course by discontinuing class attendance and filing a withdrawal form at the Office of Student Services. The student's record will then indicate status W in place of a grade for that course. No advisor approval is required, and no refund of fees will be made. Withdrawal is complete when the necessary forms have been submitted to the Office of Student Services.

Course withdrawals are normally processed up to the midpoint of the course. The student who discontinues class attendance after that time will receive a grade commensurate with the course requirements.

Instructors, with the approval of the Director of Instruction, can withdraw students for excessive absence or for extenuating circumstances, such as an accident. For further information, please contact the Office of Student Services.

## **Enrollment Status**

Registration dates are publicized well in advance of each new quarter. The following designations are used to determine a student's enrollment status:

Full-time student	12 or more credits per quarter		
3/4 time	9-11 credits	"	"
1/2 time	6-8 credits	"	"
Less than 1/2 time	1-5 credits	"	"

A first-year student, by definition, is one who has completed less than 46 program-specific credit hours; a second-year student is one who has completed 46 or more program-specific credit hours.



## Maximum Class Load

An average full-time class load per quarter in most Ivy Tech programs consists of 15-16 credit hours. A class load of more than 18 credit hours requires the approval of the Director of Instruction.

## COLLEGE FEES

The College seeks to provide quality training at the lowest possible cost. General fees are based on the number of credit hours carried. Additional costs include Divisional fees and special fees pertaining to particular courses or College activities.

In 1984-85, an in-state student attending full-time (taking 15 credit hours) was charged approximately \$342 per quarter for general fees. General fees do not include special fees, books, travel, or living expenses. Tuition and fees are subject to change by the Indiana Vocational Technical College State Board of Trustees.

## Schedule of Tuition and Fees (as of 12-1-84)

(Subject to change without prior notice)

### General Fee

Indiana Residents	\$22.75 per credit hour
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### Tuition (including General Fee)

Out-of-State Students	\$42.50 per credit hour
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### Divisional Fees

Division of Business, Office and Information Systems Technologies	\$ 1.25 per credit hour
Division of Visual Communications Technologies	\$ 4.25 per credit hour
Division of Human Services and Health Technologies	\$ 1.25 per credit hour
Division of Applied Science and Technologies	\$ 2.00 per credit hour

### Student Activity Fee

The Student Activity fee varies by enrollment status and region.

Late Registration Fee	\$10.00
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A schedule of current fees is available at Ivy Tech Centers.

## **Additional Expenses**

The following additional expenses may apply, depending upon the program of study:

**BOOKS:** All students are expected to purchase the textbooks for their respective programs. The cost of books will average about \$25 per course.

**TOOLS:** The College furnishes major equipment items for instruction; however, in many programs or courses students must furnish additional hand tools and equipment.

**UNIFORMS AND OTHER SPECIAL EQUIPMENT:** Several programs require students to furnish uniforms and special safety clothing.

**ROOM AND BOARD:** Since Ivy Tech is not a residential college, room and board fees are not applicable.

**TRAVEL:** Transportation costs to and from the College vary according to the distance and the type of transportation used.

For further information, contact the Office of Student Services.

## **Payment of Fees**

All enrolled students must make arrangements at the time of registration to pay all applicable fees. A student is officially registered and allowed to attend classes when all fees have been satisfied.

## **Refund Policy**

Students choosing to drop or withdraw from a course or courses must notify the College in writing (i.e., the drop-and-add or withdrawal form). The fee refund for voluntary withdrawal from a class, when applicable, will be processed only after the student files a College drop-and-add form or withdrawal form with the Student Services Office.

The College will refund students' assessed fees, with the exception of the late registration fee, on a schedule computed as follows:

From registration to end of first week of class	100% refund
To end of second week of class	50% refund
To end of third week of class	25% refund
After third week of class	No refund

The effective date for calculating the fee refund is the date of written notification of the drop and add or withdrawal form.

Certain fees may be refundable. For further details, please contact the Office of Student Services.

Students should allow approximately four to six weeks for processing of refund checks. All refunds will be issued by check and mailed to the address shown on the student registration form.

Cancellation of credit courses by the College will result in total refund of fees collected for those courses.



## FINANCIAL AID

Indiana Vocational Technical College offers various types of financial aid to students who need assistance to continue their education. Some aid programs are administered by the College Financial Aid Office under the policies and guidelines established by the state and federal governments; other programs are administered directly by a state or federal agency or outside organization. A few programs may be available on a regional basis only. Eligibility for most financial aid at Ivy Tech is based upon the student's *demonstrated financial need*. The student must complete either the Financial Aid Form (FAF) or the Application for Federal Student Aid (AFSA) each year. In addition, the applicant for financial aid

1. must be a citizen, national, or permanent resident of the United States;
2. must be accepted for admission to the College in an eligible program and enrolled for at least 6 credit hours each quarter;

3. must file annually an Ivy Tech application for financial aid;
4. may be required to submit documentation to verify the data provided on the FAF or AFSA;
5. must maintain satisfactory academic progress;
6. must sign draft compliance and educational purpose statements;
7. must indicate acceptance of any award by signing the appropriate student aid report or award letter within the deadlines specified by the regional Financial Aid Office.

## **Grants and Scholarships**

### ***Pell Grants***

The College requires all students seeking aid to apply for a Pell Grant. Pell Grants represent the largest federal student assistance program. Since the grant is based on the student's need, enrollment status, and cost of education at Ivy Tech, the amount may vary from quarter to quarter. To apply, the student should file the Application for Student Aid or the Financial Aid Form at the Financial Aid Office. The Pell Grant applicant will receive a copy of the Student Aid Report, which must be presented to the Financial Aid Office prior to or during the time the student is enrolled in order to determine the amount of the grant.

### ***Supplemental Educational Opportunity Grant (SEOG)***

The SEOG is a federally funded student aid program. Applicants must file the AFSA or the FAF to establish eligibility. Since the amount of SEOG funds allocated to the College by the federal government varies each year, students with high financial need will receive priority for the limited funds.

### ***Hoosier Scholarships***

The State Student Assistance Commission of Indiana may award from one to three scholarships per high school, based on the size of the graduating class. Candidates are nominated by their high schools. The Hoosier Scholarship is a one-time, nonrenewable merit award in the amount of \$500 for one academic year.

### ***Higher Education Awards (HEA)***

Residents of Indiana may apply for Higher Education Awards (formerly called State Grants). Applicants must file the FAF by March 1,

preceding their enrollment for the following fall quarter. Awards are based on demonstrated need. Recipients of HEA awards must be enrolled full-time each quarter to use them.

### ***Ivy Tech Scholarships***

Many of the regional Institutes award scholarships provided by local civic and service organizations. Students are advised to contact the Financial Aid Coordinator for details concerning available scholarships.

### ***Discretionary Fee Remission Scholarships***

Each region is authorized to grant limited fee remission scholarships at the time of enrollment to students with special needs arising from unusual circumstances. The fee remission may not exceed the general fee.

## **Employment and Loans**

### ***College-Work-Study Program***

The federally funded College-Work-Study Program provides part-time employment to students who need financial assistance. Job assignments may be within the College or in public nonprofit agencies in the community. The student is required to submit the AFSA or the FAF to the Office of Financial Aid, which will coordinate the job placement, taking into consideration the amount of the student's need, the student's class schedule, and the student's family or personal obligations. The starting hourly rate will be at least at the federal minimum wage level. Employment may consist of, but is not limited to, secretarial and clerical office work, maintenance or custodial work, duties in the Learning Resource Center (LRC), or work as lab assistants. Where possible, students are offered work-study assignments in areas related to their career objectives.

### ***Indiana Guaranteed Student Loan (GSL) Program***

Students who attend classes at least half-time may borrow up to \$2,500 per year from private lenders, such as commercial banks, savings and loan associations, or credit unions. The interest rate on a GSL, which is determined by Congressional action at the time of the student's first application for the loan, may be from seven- to nine-percent. The federal government pays the interest on the loan during

the time the student is in school, provided the borrower has met certain criteria set by the federal government for the interest subsidy.

Repayment begins six months after the student graduates or ceases at least half-time attendance. Applications for an Indiana Guaranteed Student Loan may be obtained from Ivy Tech Financial Aid Offices or from a hometown bank, savings and loan association, or credit union. The Financial Aid Coordinator must complete a portion of the loan application and approve it before it can be returned to the lender for processing.

### ***Parent Loan for Undergraduate Students (PLUS)***

The PLUS program is designed to assist students in financing their education when all other types of financial assistance have been denied and/or exhausted. An independent undergraduate student is eligible to borrow a maximum of \$2,500 per year through the PLUS and GSL programs combined.

Parents of dependent undergraduate students are eligible to borrow a maximum of \$3,000 in addition to the \$2,500 that the student may be eligible to borrow under GSL. The interest rate is currently 12 percent, and repayment begins within thirty to sixty days after the loan is made. The federal government does not pay the interest on this loan.

## **Other Sources of Financial Assistance**

### ***Veterans' Benefits***

Students who served in the armed forces may be eligible for veterans' benefits. The Veterans Administration determines eligibility for all veterans. Eligible recipients of veterans' benefits are entitled to one-and-one-half months of educational assistance for each month of active duty after January 31, 1955, up to a maximum of 45 months.

The amount of monthly educational allowance is based on the number of dependents and the training time. For Associate Degree students, training time is based on the number of credits taken; for Certificate students, training time depends on the number of contact hours taken per week.

Applications for educational benefits may be obtained from the Ivy Tech regional Office of Veterans Affairs. The student should apply for these benefits at the regional Institute of his or her choice at the earliest possible date. The College is responsible for reporting the attendance of veterans and certifying that they are making reasonable progress toward an educational objective. Each regional campus

of Ivy Tech has a Veterans Affairs Coordinator who handles the reporting duties and offers assistance to veterans.

### ***Child of Disabled Veteran (CDV) Benefits***

Children of veterans who are deceased or disabled as a result of service-connected injury may be eligible for veterans' benefits. Please contact the Ivy Tech regional Veterans Affairs Coordinator to apply for benefits.

Indiana residents who are children of deceased or disabled veterans, or of veterans awarded the Purple Heart, may be eligible for a fee waiver at Ivy Tech if the parent's death, disability, or Purple Heart award occurred as a result of military service during wartime. Inquiry concerning this benefit may be made at the Ivy Tech regional Office of Veterans' Affairs or Financial Aid Office.

### ***Police and Fire Fighters' Orphans' Benefits***

Children of deceased, regularly paid, law enforcement officers and fire fighters are eligible for a fee waiver if the parent's death occurred in the line of duty. The fee waiver is granted only to full-time students under the age of 23. Certification from the appropriate agency must be presented to the College in order to obtain the fee waiver.

### ***Vocational Rehabilitation***

Students with disabilities that may be considered handicaps to employment may qualify for benefits through the Indiana Rehabilitation Services Board. The local office of the Division of Vocational Rehabilitation (DVR) establishes the conditions of eligibility and awards assistance, based on individual need. The DVR expects students to apply for the Pell Grant and other forms of financial aid through the school. However, if these resources are not sufficient to meet their needs, the DVR may provide additional funding. Contact the local DVR counselor for further information.

### ***Job Training Partnership Act (JTPA)***

Students from economically disadvantaged backgrounds may be able to obtain assistance in acquiring vocational training or in upgrading occupational skills through the Job Training Partnership Act as implemented in October 1983. For further information, the student should contact the local Private Industry Council (PIC) Office.

### ***Trade Readjustment Act (TRA)***

The Trade Readjustment Act provides full tuition and fees, books, and supplies to eligible students. Students should check with their local Indiana Employment Security Division to determine eligibility.

### ***Employer Funded Education***

Many employers are willing to fund courses taken at Ivy Tech in full or in part when the training offered relates to the employee's job responsibilities. Interested students should contact their employers to determine if such an arrangement can be made.

### ***Industry-Union Training Funds***

Many unions have training funds available for members. Interested students should contact their union regarding availability of training funds for use at Ivy Tech.

### ***Application Procedures for Financial Aid***

Application forms are available in the regional Financial Aid Office. Because application procedures, deadlines, eligibility regulations, and refund policies vary with different types of student aid, interested students are encouraged to contact the Financial Aid Office at their earliest convenience. The summer quarter marks the beginning of a financial aid award year.

### ***Appeals—Financial Assistance***

The following steps are recommended to the student who feels that he or she has received unfair treatment in the financial assistance process:

1. Schedule a personal conference with the Financial Aid Coordinator to discuss and resolve the issue.
2. If Step 1 is unsatisfactory, schedule a consultation with the Financial Aid Coordinator and his or her supervisor.
3. If Step 2 is unsatisfactory, schedule a conference with the Student Status Committee.
4. If Step 3 is unsatisfactory, schedule a conference with the regional Vice-President/Dean to resolve the issue.

## **STUDENT RECORDS**

Indiana Vocational Technical College, in compliance with the Buckley Amendment to the federal General Education Provisions Act,



provides for the privacy of students and their parents regarding access and disclosure of records maintained by the College. No personal student information, other than directory information, may be released by the College without the permission of the student.

The following personal student data is designated as directory information:

1. Name
2. Address
3. Date and place of birth
4. Major field of study
5. Participation in officially recognized activities and sports
6. Weight and height of members of athletic teams
7. Dates of attendance
8. Degrees and awards received
9. The most recent previously attended educational institution
10. Similar information (which may be added and posted by regions)

A student can deny permission to disclose all or any part of the directory information by filing a written refusal, designating the particular information to be withheld, at the Office of Student Services.

Student records are held in security by the College. All transcripts on file with the College from high schools and other institutions of higher education cannot be released by Ivy Tech. A student needing a transcript from high school or another college should request it directly from that institution.

The Office of Student Services will assist students wishing to see and review their academic records and student files. All questions concerning student records and information should be directed to the Office of Student Services.



## **ACADEMIC GRADING—Definitions and Procedures**

At the end of each enrollment period, a term grade or indication of status is entered on the student's permanent record for each course in which he or she is registered.

In all courses, the quality of the student's work is important in determining the grade given. For some courses, quantity of work, speed of work, or both, are considered in determining the grade. Attendance may also be considered by instructors in awarding grades.

In certain instances, a status indication will appear on the student's record in place of a grade. Status represents a condition to which no letter grade can be assigned.

Students receive quarterly reports of their grades and/or status. The quarterly grade report is not mailed to students who still owe fees.

### **Grades**

The quality of student performance or competency level, as determined by the instructor at the completion of a course, is indicated by a letter grade of A, B, C, D, or F. Each letter has a numerical value per credit hour, referred to as "grade points." The meaning and grade point value per credit hour of each letter grade is shown in the table below:

<b>Grade</b>	<b>Interpretation</b>	<b>Grade Points Per Credit</b>
A	Outstanding achievement	4
B	Above average work	3
C	Average work	2
D	Poor, below average work	1
F	Failing work	0

## **Status**

Status describes the state or condition of a course appearing on the student's record that has not received a grade. Status indications carry no grade points. The types of status and the symbols used to indicate them are shown below:

### **Status**

IP	In Progress
I	Incomplete
W	Withdrawal
AU	Audit
S	Satisfactory/Test-out
T	Transfer

### ***IP-In-Progress***

In-Progress (IP) describes an intermediate status applicable only to courses that are entirely individualized, to courses open to enrollment at any time during a given quarter, or to courses of longer duration than the normal eleven-week term. A student who, at the end of any College quarter, has not completed such a course but plans to continue the course work into the next quarter, can be assigned IP status for that course. The course work should be completed, with grade awarded, within a time period comparable to that which is usual for regularly scheduled classwork, unless otherwise authorized by the Director of Instruction. An intermediate status must be converted to a grade within a specified period of time.

### ***I-Incomplete***

Incomplete (I) describes an intermediate status assigned to a student who has not completed certain course requirements, but who has made arrangements with the instructor to complete the unfinished work. The instructor will designate the time period in which the final test or course work is to be completed. This period is limited to thirty calendar days following the last day of the quarter for which the

incomplete status was assigned, unless otherwise authorized in writing by the Director of Instruction.

### ***W-Withdrawal***

Withdrawal (W) is a terminal status, referring to the voluntary withdrawal by a student from a course from the beginning of the fourth week of class to the midpoint of the completed course. To be considered officially withdrawn from a course, the student must file a withdrawal form at the Student Services Office.

Instructors can, with the approval of the Director of Instruction, withdraw students for excessive absence or for extenuating circumstances, such as an accident. Students will be notified prior to such action.

### ***AU-Audit***

Audit (AU) status indicates enrollment in a course for no grade or credit. The fees for audited courses are the same as those for courses taken for credit. Audit status must be declared at time of registration.

### ***S-Satisfactory/Test-out***

Satisfactory (S) status indicates fulfillment of course requirements based on test-out, work experience, or previous education. Course credit may be granted on the basis of examination (test-out) and/or evaluation of previous work and training.

### ***T-Transfer***

Transfer (T) status indicates acceptance by Ivy Tech of credit earned at other accredited post-secondary institutions. Transfer credit for grades of A, B, or C can be granted upon evaluation for equivalency and relevance. The final authority for T credit rests with the Director of Instruction.

## **Credit Hours**

Credit is described in quarter hours (the number of credits taken per quarter). The number of credits is determined by the demands of the course and course work and by the number of contact hours — the hours actually spent in the classroom or laboratory. A 3-credit course, for example, may entail 4 hours per week of actual classroom and/or lab work.

## Grade Points

Grade points are numerical values indicating the quality of student performance in credit courses: A=4; B=3; C=2; D=1; F=0. The grade points earned for a course equal the grade point value times the number of credits. A student who earns an "A" in a 4-credit course earns 16 grade points; the grade point value (4)  $\times$  the number of credits (4) = total grade points (16).

## Grade Point Average

The grade point average (GPA) is a numerical indication of the student's performance in all courses attempted during a single quarter. The GPA is obtained by dividing the number of grade points earned in the quarter by the number of credits attempted. The average, calculated to three decimal places, will appear on each quarterly grade report, as shown in the example below:

Course	Grade		Point Value per Credit		Credits		Grade Points
XXXX	B	=	3	$\times$ (times)	4	=	12
XXXX	A	=	4	$\times$	3	=	12
XXXX	A	=	4	$\times$	5	=	20
					Total	12	Total 44

The total number of Grade Points (44), divided by the total number of credits (12), results in a GPA of 3.666.

## Grade Point Index

The grade point index (GPI) is a measure of the student's cumulative scholastic performance at Ivy Tech. The GPI is obtained by dividing the total number of grade points earned by the total number of credits attempted. The index, calculated to three decimal places, will appear on each quarterly grade report.

## Attendance

Regular attendance is expected at scheduled class meetings or other activities assigned as part of a course of instruction. Instructors will maintain attendance records.

Personal circumstances may occasionally render it impossible for students to attend scheduled classes and activities. The College expects students to confer with instructors when such circumstances can be anticipated. With advance notification, instructors can offer students the option of making up the material missed. When circumstances are unforeseen, students should consult with their instruc-

tors to arrange make-up work, if possible. Absences may be considered by instructors in awarding grades.

Students who must interrupt their Ivy Tech training to fulfill Reserve and National Guard annual tour requirements should present official military orders to their instructors prior to departure for duty. Students are not excused from completion of the course work and should make arrangements with their instructors to complete all work.

## **Improving a Grade**

Students, with the approval of faculty advisors, may attempt to improve grades by repeating courses. Financial aid recipients, however, should review their situations carefully, since payment for repeated courses can be disallowed. Permanent student records contain complete files of all activity. The student's grade point index will reflect the highest grade earned.

## **Grade Reports**

Final grades are mailed to the address on the registration form. Grade reports are not sent if there are financial obligations to the College outstanding.

## **Dean's List**

The Dean's list, prepared and published each quarter, gives recognition to students who achieve a 3.50 grade point average or higher while enrolled for 12 or more credits during the quarter.

## **STANDARDS OF PROGRESS**

Students are expected to maintain a minimum quarterly GPA of 2.00. Students receiving financial aid must demonstrate progress toward completion of a program within a specified time frame, based on their enrollment status. Also, they must successfully complete the minimum number of credit hours required for that status each quarter. All students are expected to maintain a minimum 2.00 in all courses within certification requirements and to maintain a cumulative 2.00 for graduation eligibility.

## **Academic Probation**

A student is placed on academic probation when he or she fails to maintain the standards of progress. At this point, counseling and/or advising may intervene. Students are automatically removed from

probation if satisfactory progress is reestablished the following quarter.

### **Unsatisfactory Progress**

If a student on academic probation fails to meet the standards of progress for two consecutive quarters, he or she is given unsatisfactory progress status. At this point, counseling and/or advising will intervene. For further information, contact the Office of Student Services.

### **Special Problems**

Students should see the Director of Student Services regarding College procedures for solving special problems, granting exceptions, and filing grievances (see Student Grievances). Special problems, exceptions, and grievances are ultimately the responsibility of the Vice-President/Dean of the region and designated staff and committees.



## **GRADUATION**

The Associate in Applied Science degree or other appropriate certificate is awarded by the College to students who meet graduation and certification eligibility requirements. Graduation ceremonies are held at least once a year. Graduating students are charged a fee to cover the cost of the ceremonial cap and gown.

A student is considered eligible for graduation when he or she fulfills the requirements for graduation and certification at his or her program level. Each student entering the final quarter of training prior to graduation will complete an Application for Graduation form. The application will be certified by the student's advisor and forwarded to

the Office of Student Services, where the appropriate diploma will be prepared.

To graduate with an Associate in Applied Science degree, the student must:

1. attain a minimum grade point index of 2.0 in the required technical and general education courses, with not more than one course in each of these areas at a "D" or lower performance level;
2. complete successfully all courses within certification requirements with a minimum grade point index of 2.0;
3. earn the last 15 credits as a regular student of Ivy Tech, rather than by test-out or other means of advanced placement;
4. complete successfully the Ivy Tech certification requirements;
5. satisfy all financial obligations to the College.

To graduate with a Technical Certificate, the student must:

1. attain a minimum grade point index of 2.0 in the required technical courses with not more than one course at a "D" or lower performance level;
2. complete successfully all courses within certification requirements with a minimum grade point index of 2.0;
3. earn the last 15 credits as a regular student of Ivy Tech, rather than by test-out or other means of advanced placement;
4. complete successfully the Ivy Tech certification requirements;
5. satisfy all financial obligations to the College.

## PLACEMENT

The Placement Office at each region of Ivy Tech actively assists registered graduates and students in finding jobs. Interested students should register for placement assistance at the Office of Student Services. The College will make every possible effort to find suitable employment for its graduates.

Candidates for graduation who desire placement assistance should contact the Office of Student Services, which will:

1. advise candidates of the College placement services;
2. distribute registration forms for the placement service;
3. provide occupational information, including employment trends and local and state occupational outlook data;
4. assist the registered candidate in preparing a packet of credentials for use in finding a job. The packet may include:
  - a. a resume of the candidate's education and employment experience;



- b. personal letters of recommendation verifying the student's employability;
5. create folders containing original copies of the candidate's credentials for all registered candidates;
6. prepare copies of credentials released by the candidates for referral to prospective employers. Alumni may update their credentials whenever they wish to use the placement service.

Students registered with the College Placement Office will be informed of employment opportunities known to the regional Placement Offices.

Employers who register with the Placement Office are given the names of all qualified candidates without regard to sex, race, age, national origin, or handicap. Registered students are eligible for interviews with appropriate prospective employers.



## **STUDENT ORGANIZATIONS AND ACTIVITIES**

The College recognizes the educational, recreational, and social values of student organizations and extracurricular activities complementing the institution's academic programs. Students are encouraged to participate in any or all phases of the student activities program as long as it does not interfere with studies.

All student organizations operate under the policies and guidelines set for the College by the State Board of Trustees. Approval by the Student Senate and the administration is required of all student organizations seeking to make use of the College facilities. All approved organizations must be open for membership to all eligible candidates and must make available to the Student Senate all records of officers, membership, and financial transactions.

## Student Senate

Students in each region are provided opportunities to participate in student government through membership in the Student Senate. The Student Senate is the representative governing body of the students. Student Senate representatives are elected or selected according to the bylaws of each regional Student Senate constitution and serve as stated in those bylaws.

The student body membership may consist of representatives of the first-year class, the second-year class, each program area (offered in the region), and a faculty advisor as established in the bylaws of that region.

The Student Senate was established by students to encourage participation in student government and to promote College spirit and recognition. The Student Senate exercises the authority, unless otherwise delegated, to legislate on student matters, subject to the approval of appropriate College administrative offices.

The constitutions of all student organizations must be approved by a quorum of the Student Senate, consisting of a simple majority of the total membership and one staff advisor, or as otherwise stated in the bylaws.

The functions of the Student Senate include:

1. communication of bona fide concerns of the student body and suggestions for improvement to appropriate College officials;
2. approval of those student organizations deemed beneficial to student life and worthy of being a part of the College;
3. assurance that copies of the constitution, bylaws, and statement of purpose and objectives of each recognized student organization are on file in the Office of Student Services;
4. referral of student grievances concerning disciplinary matters or student status to the Committee on Student Status; referral of other types of student grievances to appropriate College officials;
5. planning and conducting of appropriate extracurricular student activities;
6. submission of student activity budgets for review and approval by the regional administration.

## Intramural Sports

College sports activities consist of intramural sports sponsored by the Student Senate. Leagues can be formed when student interest justifies their organization. All sports activities of the College must be

approved and sponsored by the Student Senate and the administration.

## **Class Organizations**

The primary purpose of class organizations is to promote class-wide social activities and sports functions. Each first- and second-year class may elect a class president, vice-president, secretary-treasurer, class reporter, and representatives-at-large for the Student Senate. Class organizations must be sponsored by the Student Senate.

## **Clubs**

Students wishing to organize hobby, social, or special interest clubs should submit proposals to the Student Senate, which will determine whether sufficient interest exists to form or continue a club. The Student Senate is authorized to charter the club upon approval by the administration. Each club must have the following elected officers: president, vice-president, secretary-treasurer, club reporter, and a Student Senate representative. Each club must also have a staff advisor.

## **Social Activities**

All group activities of the College must be approved and sponsored by the Student Senate and the administration. Classes, clubs, and other groups should plan and conduct social activities pertaining specifically to their members. The Student Senate organizes and conducts school-wide social activities and gatherings in which all students and their guests may participate.

## **Professional and Trade Societies**

Student chapters of various professional and trade societies will be formed in the same manner as other student organizations and are subject to the same requirements.

# **STUDENT RIGHTS AND RESPONSIBILITIES**

## **Standards of Conduct**

Students enrolled at Indiana Vocational Technical College are expected to conduct themselves in a mature, dignified, and honorable

ble manner. The reputation of the College in the community depends in large part upon the behavior of its students.

Students are subject to College jurisdiction on College matters during their period of enrollment. The College reserves the right to take disciplinary action against any student whose conduct, in the opinion of Ivy Tech representatives, has not been in the best interests of other students or the College. Disciplinary action may consist of verbal reprimand, restitution for damages, restriction of privileges, suspension, or dismissal. Students, in turn, have the right of due process.

All Ivy Tech students are expected to abide by the following College rules of conduct.

## **College Rules**

### **1. ALCOHOLIC BEVERAGES**

Any student found guilty of drinking, being under the influence of, or possessing intoxicating beverages on College property is subject to disciplinary action and state law.

### **2. ILLEGAL USE OF DRUGS**

The illegal use of drugs is strictly prohibited on College property. Any student found using, under the influence of, in possession of, or distributing illegal drugs is subject to disciplinary action and state law.

### **3. SMOKING**

Students may smoke in private offices, conference rooms, and other areas as designated by the Vice-President/Dean. Smoking is generally prohibited in carpeted areas and in posted "No Smoking" areas, in accordance with fire regulations and consideration for campus environment.

### **4. ASSEMBLY**

Persons shall not assemble in a manner that obstructs the free movement of others about the campus, inhibits the free and normal use of the College buildings and facilities, or prevents or obstructs the normal operations of the College.

### **5. SIGNS**

Students may not erect signs on campus or display signs or posters, except on designated bulletin boards, without the authorization of the Vice-President/Dean or designee. Also, students shall not deface, alter, tamper, destroy, or remove any sign or inscription on College property.

### **6. SOLICITATION OF FUNDS**

No student or student organization may use campus facili-

ties or schedule activities to solicit funds without the approval of the Vice-President/Dean or designee.

**7. ARMS/DEADLY WEAPONS**

Firearms (except for those possessed by police officers) are strictly prohibited on College property or at any College-sponsored activity held elsewhere. Any student possessing deadly weapons at these locations is subject to disciplinary action.

**8. CHEATING**

Any student found cheating on papers or tests is subject to disciplinary action. Such action may be taken in accordance with College procedures as deemed necessary by the instructor.

**9. COUNTERFEITING AND ALTERING**

Students shall not copy or alter, in any manner, shape, or form, any record, document, or identification form used or maintained by the College.

**10. THEFT OF PROPERTY**

Any theft of personal or College property will be treated as a violation of College rules.

**11. VANDALISM**

The destruction or mutilation of College books, magazines, equipment, or buildings is prohibited. Such action may result in restitution and/or other disciplinary measures.

**12. USE OF COLLEGE FACILITIES**

Students are permitted on campus during normal College hours and at other times established in the College calendar. Students wishing to utilize College facilities at other times must request permission from the Vice-President/Dean or designee.

**13. FINANCIAL RESPONSIBILITY**

Students owing fees, fines, or loans shall not be permitted to register for a succeeding session. Grades, records, degrees, etc., will not be awarded until debts to the College are paid.

**14. MOTOR VEHICLES**

The College has established student, staff, and visitor parking areas. All persons are required to park in their respectively designated areas and to adhere to College parking regulations. Posted speed limits must be obeyed.

## Violations

Persons found in violation of laws and ordinances on College property shall be subject to prosecution by the appropriate law enforcement official(s).

Persons found in violation of College regulations shall be subject to disciplinary action by the College through due process procedures for student conduct violations.

The College maintains jurisdiction over matters such as, but not limited to, alcoholic beverages, illegal use of drugs, smoking, financial responsibilities, motor vehicles, assembly, soliciting, use of College facilities, the posting or erection of signs, theft, arms/deadly weapons, cheating, counterfeiting, and vandalism.

The Vice-President/Dean designee in the Office of Student Services will make available copies of the student conduct regulations to all students not later than the first day of instruction.

## Due Process Procedures for Student Conduct Violations

1. Cases or appeals of student misconduct and/or lack of academic integrity are to be referred to the appropriate designee of the Vice President/Dean or to the Chair of the Student Status Committee for evaluation. This College representative:
  - a. will be responsible for all initial disciplinary procedures;
  - b. may recommend temporary suspension of a student to the Vice-President/Dean for a period of time until the Student Status Committee can meet.
  - c. may recommend to the Vice-President/Dean (on recommendation of the instructor) that a student be withdrawn from a course or program or from the College for disciplinary reasons.
2. Students recommended for dismissal will be notified by their advisors in writing. Students will be given an opportunity to appeal the decision of the Student Status Committee if they so choose.
3. The Student Status Committee deals with all cases relating to disciplinary actions or the academic status of students. Each regional institute has a Student Status Committee that makes recommendations to the Vice-President/Dean.
  - a. The Student Status Committee will be composed of at least six members, including two full-time instructional staff members and two administrative staff persons appointed by the Vice-President/Dean of the region. The additional two members will be students designated by the Student Senate. The Committee's review and subsequent disposition of a formal complaint will begin no later than thirty (30) days after receipt of the writ-

ten complaint. Staff legal counsel, as needed, will be available to the Committee.

- b. The Student Status Committee will assure the student due process. A written statement will be presented to the student by the chairman of the Student Status Committee. The student will be invited to speak on his or her own behalf.
- c. The Student Status Committee will issue a recommendation to the Vice-President/Dean following its deliberation. Disciplinary probation or dismissal from the College will be final only after review by the Vice-President/Dean, who may approve or disapprove the recommendation of the Student Status Committee. (Students dismissed for disciplinary reasons will not be entitled to refunds.)
- d. The student will be informed in writing of the decision of the Student Status Committee and of the subsequent recommendations to the Vice-President/Dean, whose decision is final. A copy of the written recommendations from the committee will be filed in the student's folder in the Office of Student Services.
- e. If the student disagrees with the Student Status Committee recommendation, he or she may file a complaint with the regional Vice-President/Dean within 72 hours after notification of the Student Status Committee's decision.
- f. Exceptions to these rules may be made in extenuating circumstances at the discretion of the Vice-President/Dean or his designee upon request by the party involved.

## **Student Grievances**

Students may bring legitimate grievances to the attention of their instructors or other advisors. Time will be provided for grievance conferences within two weeks of the complaint. The purpose of the conference is to discuss the problem and to find, if possible, a mutually satisfactory resolution.

If the grievance concerns an instructor or an advisor, the student may request a conference with a department head, chairperson, the Director of Student Services, or the Director of Instruction, as deemed appropriate. The conference will be held within two weeks of notice of the complaint.

The student who feels his grievance has not been adequately addressed by these methods may follow a prescribed grievance procedure. A full explanation of this procedure is available from the Office of Student Services.

## GENERAL INFORMATION

### Housing

Indiana Vocational Technical College does not operate residence halls. Limited assistance is provided by the Office of Student Services to out-of-town students needing accommodations. The College accepts no responsibility for locating, approving, or supervising local student housing.

### Student Parking

Registration of motor vehicles parked on the College premises is requested to help maintain a safe and organized parking area. At the time of registration, the student may receive a parking sticker from the cashier's office to be displayed on the student's vehicle while on campus. Students are expected to park only in designated student parking areas. Vehicles improperly parked in areas reserved for the handicapped, visitors, or others may be towed away at the owners' expense. A special permit is required to park in the handicapped zone. For details, contact the Office of Student Services.

### Library Facilities

The Library/Learning Resource Center offers reference materials, leisure reading, materials related to all program areas of the College, career exploration materials, general magazines and newspapers, audiovisual materials and equipment, interlibrary book loans, textbooks on reserve for in-library use, reference services, and library use assistance.







## **College Bookstore**

The College maintains a bookstore in each regional institute. All books and regular supplies needed by students throughout the academic year are for sale at the bookstore. College sweaters, jackets, souvenirs, and other items may also be available for purchase.

## **Student Insurance**

Each Ivy Tech student registered in credit courses is insured for a designated amount for loss resulting from injuries sustained while participating in College-sponsored activities, providing the activity takes place on College premises or any other premises designated by the College. Coverage is also afforded while traveling directly to and from a College-sponsored activity, provided such travel is as a member of a group under College supervision.

The Master Policy for this insurance is issued to Indiana Vocational Technical College and is on file at the office of the Director of Insurance at College Central Offices. The description of the hazards insured, benefits, and exclusions is controlled by the Master Policy.

College coverage is not intended to replace individual insurance coverage. The student is encouraged to review his or her own coverage. For further information, contact the Office of Student Services.

## **Emergency Closing of Campus**

Severe weather conditions or other emergency may necessitate closing a campus. Students will be notified of emergency closings by mass media. Students should listen to designated local radio stations for news of emergency closings.

# INSTRUCTIONAL PROGRAMS

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In keeping with its mission and goals, the College serves people sixteen years and older with educational programs consistent with projected job requirements and personal interests. Ivy Tech programs complement secondary vocational, two-year engineering technology, four-year engineering, and basic adult education programs. The purposes of Ivy Tech's training are to develop competent workers for initial employment and to upgrade the skills of those already employed. Ivy Tech programs provide skills training and instruction in recent technological advancements and developments.

Ivy Tech programs are designed to meet the needs of the student population, accommodating those who wish to enroll in a few classes as well as those who prefer a full program. Credit programs normally culminate in the Associate in Applied Science degree or Technical

Certificate. A few selected programs lead to a shorter-term Occupational Certificate. The programs are offered in 53 program areas in the following four college divisions:

- Business, Office and Information Systems Technologies;
- Visual Communications Technologies;
- Human Services and Health Technologies;
- Applied Science and Technologies.

Short-term training is available in selected credit courses, in sequences of credit courses, and in custom-designed credit courses for local businesses and industries. Also available are contract training programs, and noncredit institutional activities, such as seminars, workshops, and conferences.

## **Associate in Applied Science (AAS) Degree Programs**

Associate in Applied Science degree programs prepare students for career mobility within occupational clusters at the technician or technology level. The programs offer training in recognized technologies and specialties with emphasis on analysis, synthesis, and evaluation. The program content, which is approximately 75% technical and 25% general education, provides both depth and breadth in conceptual and manipulative skills. The general education courses, offered in the areas of communications (written and oral), human relations, mathematics, and science, equip students with the occupation-related technical and social skills they need to compete successfully in the job market. Elective courses, determined regionally, provide flexibility in each program to meet the specific needs of local employers. Most AAS degree programs require 90 credits of coursework, including regionally determined electives, though some programs, for sound reasons, require more credit hours.

## **Technical Certificate (TC) Programs**

Technical Certificate programs provide training in conceptual and manipulative skills for specific occupations. Each program contains a sequence of required courses in a recognized specialty within one of the technologies taught at the College. The program content, which includes general education courses, is designed to develop competency in the comprehension of and technical skills in that specialty. Most Technical Certificate programs require 45 credits of course work, though some programs require more.

## **Occupational Certificate (OC) Programs**

Occupational Certificate programs consist of defined sequences of courses leading to specified occupational goals. The programs, containing from 15 to 44 credits of course work, are designed to develop competency in recalling and applying acquired knowledge in specific occupational areas. The certification standards are determined by each regional institute. Many special needs of business and industry, not met appropriately through AAS or TC programs, are fulfilled through specific OC programs.

## **Custom-designed Programs and Selected Courses or Sequences of Courses**

To meet specific needs of students or employers for short-term occupational preparation, the College offers single courses or sequences of courses assembled as required. Special demands can often be met with credit courses selected from the existing curricula. Available, also, are custom-designed short-term credit courses for local businesses and industries, contract training programs, and non-credit instructional activities, such as seminars, workshops, and conferences.

## **Skills-Development Courses**

Skills-development or learning-skills courses are offered at each regional Learning Resource Center. These courses emphasize the basics in mathematics, communications, reading, and science, combined with supplementary material oriented toward specific occupations. All skills-development instruction is designed to enable students to be successful in their technical courses. Instruction includes classroom and self-paced courses. Credits granted for skills-development courses may be applicable toward requirements for graduation.

## **Programs**

On the following pages are the current listings of credit programs offered by Ivy Tech in one or more of the College's thirteen regional centers. Approval has been granted to offer programs at the Associate Degree level, the Technical Certificate level, and at the Occupational Certificate level. The listings indicate the highest level at which a program can currently be offered by the College in any region; programs may be available at the highest level in the region you plan to attend. Contact the center nearest you for information concerning the level of program offerings in your area.

# **DIVISION OF BUSINESS, OFFICE AND INFORMATION SYSTEMS TECHNOLOGIES**

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Career opportunities in businesses and offices are expanding rapidly. Employment statistics indicate the better job opportunities in business may be available to persons equipped with the technical skills required in today's business world. In recognition of the impact of changing technology on business affairs, Ivy Tech's Division of Business, Office and Information Systems Technologies offers programs designed to prepare persons for employment in one of many occupations relevant to Indiana businesses.

## **ACCOUNTING TECHNOLOGY**

The program develops understanding of accounting principles, business law, communications, and business machines used in the field. Training is offered in modern computerized accounting systems. Technical skills in cost accounting, tax preparation, auditing, budgeting, and consumer credit are emphasized. An optional concentration in credit and finance is available in some regions.

Typical duties in accounting include posting accounts receivable and payable, preparing and making bank deposits, billing, preparing payroll, maintaining inventory records, purchasing supplies, and processing expense reports. Position titles may include junior accountant, junior auditor, cost accounting clerk, bookkeeper, payroll clerk, inventory clerk, and management trainee.

The Division of Business, Office and Information Systems Technologies offers a two-year Accounting Technology program, requiring 94 credits, that leads to an Associate in Applied Science Degree. A one-year Technical Certificate program is also available. Please contact your local center for information concerning specific courses or the programs offered.

*Programs* and courses are offered in Anderson, Bloomington, Columbus, Connersville, Evansville, Fort Wayne, Gary, Indianapolis, Kokomo, Lafayette, Lawrenceburg, Logansport, Madison, Muncie, Richmond, Sellersburg, South Bend, Terre Haute, and Warsaw. In addition, selected *courses* are available in Angola, Attica, Berne, Bluffton, Boonville, Brownsburg, Clinton, Columbia City, Connersville, Crane, Crawfordsville, Danville, Delphi, Elkhart/Mishawaka, Fowler, Frankfort, Greencastle, Greenfield, Hammond, Huntington, Kendallville, Lebanon, Liberty, Linton, Marion, Martinsville, Monticello, Mount Vernon, Princeton, Rushville, Tell City, Valparaiso, Wabash, Washington, and Westfield.

## **ASSOCIATE IN APPLIED SCIENCE DEGREE program**

### **TECHNICAL COURSES (45 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
0110	Accounting Principles 1	4
0120	Accounting Principles 2	4
0122	Business Law 1	3
0130	Accounting Principles 3	4
0140	Intermediate Accounting 1	4
0141	Individual Income Taxes	4
0142	Job Order Cost Accounting	4
0143	Business Law 2	3
0150	Intermediate Accounting 2	4
0151	Process Cost Accounting	4
0160	Intermediate Accounting 3	4
1236	Office Calculating Machines	3

### **GENERAL EDUCATION COURSES (20 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4
8401	Human Relations	4

### **REGIONALLY DETERMINED ELECTIVES (29 Credits)**

Electives (See Course Descriptions section)	<u>29</u>
<b>Total credits</b>	<b>94</b>

## ACCOUNTING TECHNOLOGY-CREDIT AND FINANCE OPTION

The two-year program option in credit and finance, requiring 105 credits, leads to an Associate in Applied Science Degree. The Credit and Finance option can also lead to a one-year Technical Certificate.

### ASSOCIATE IN APPLIED SCIENCE DEGREE program

#### TECHNICAL COURSES (51 Credits)

Course #	Course Title	Credits
0110	Accounting Principles 1	4
0120	Accounting Principles 2	4
0122	Business Law 1	3
0130	Accounting Principles 3	4
0143	Business Law 2	3
0153	Microeconomics	3
0171	Finance 1	3
0172	Finance 2	3
0173	Consumer Credit	3
0174	Credit Procedures	3
0175	Credit Management 1	3
0176	Credit Management 2	3
0177	Commercial Credit	3
0178	Credits and Collections	3
0323	Business Principles and Organization	3
0913	Techniques of Supervision 1	3
1236	Office Calculating Machines	3

#### GENERAL EDUCATION COURSES (23 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8213	Mathematics of Finance 1	4
8401	Human Relations	4

#### REGIONALLY DETERMINED ELECTIVES (31 Credits)

Electives (See Course Descriptions section)

Total	<u>31</u>
	105

## SMALL BUSINESS OPERATIONS MANAGEMENT

The program develops supervisory and managerial skills needed for self-employment or for general administrative positions with small and medium-sized firms and retail commercial businesses employing fewer than 250 people, such as fast foods, appliance sales, computer stores, small loan offices, supermarkets, and retail shops. The program emphasizes accounting, business law, principles of retailing, advertising, insurance, buying and inventory control, and management. In addition, the program helps the student assess personal skills and interests which relate to entrepreneurial success.

The curriculum also trains for entry-level managerial and supervisory jobs in office administration and management in small and medium-sized firms or in departments of larger organizations. Emphasis is placed upon technical skills in accounting, supervision, office administration, personnel administration, and marketing.

A two-year program, requiring 90 credits, leads to an Associate in Applied Science Degree. Also offered is a one-year Technical Certificate. The student is advised to contact the nearest center concerning specific courses or the programs offered.

*Programs* and courses are offered in Columbus, Evansville, Fort Wayne, Indianapolis, Lafayette, Marion, Muncie, Richmond, Sellersburg, South Bend, and Terre Haute. In addition, *selected courses* are available in Anderson, Angola, Attica, Berne, Bluffton, Boonville, Clinton, Columbia City, Crane, Crawfordsville, Delphi, Fowler, Frankfort, Gary, Greencastle, Hammond, Huntington, Kendallville, Kokomo, Logansport, Monticello, Mount Vernon, Princeton, Tell City, Valparaiso, Warsaw, and Washington.

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (17 Credits)

Course #	Course Title	Credits
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One course in each of the following areas:

Business Foundation	3
Business Law	3
Management/Supervision	3
Accounting	4
Purchasing and Inventory Control	4

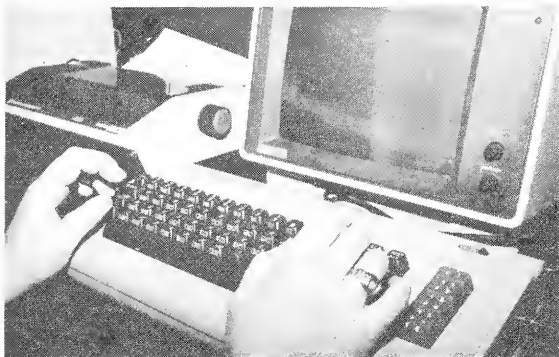
### GENERAL EDUCATION COURSES ( 24 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4
8213	Mathematics of Finance 1	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (49 Credits)

Electives (See Course Descriptions section)	49
Total credits	90





## COMPUTER PROGRAMMING TECHNOLOGY

The program trains computer programmers, systems analysts, technicians, and operators. BASIC, COBOL, RPG-II, and special languages for personal computers are taught, using mainframe, mini, and microcomputers. Other courses in the curriculum include data processing fundamentals, problem-solving, systems analysis and design, database, and operating systems. Courses pertaining to computer applications, including robotics, computerized numerical control machines (CNC), and computer-aided design (CAD) are also offered. Emphasis on business, graphics, software applications and/or trade and technology may be available on a regional basis.

Systems analysts prepare problem descriptions, detailing the steps the computer must follow in solving the problem. The applications programmer then writes a specific program for the problem, using an appropriate computer language. In smaller organizations the programmer-analyst is responsible for both functions. Computer operators monitor and control the computer, deciding what equipment should be used for each job, processing the input, and monitoring the computer while it is in operation.

A two-year program, requiring 100 credits, leads to an Associate in Applied Science Degree. Also offered is a one-year Technical Certificate. The student is requested to contact the nearest center concerning specific courses and the programs of study offered.

*Programs* and courses are offered in Anderson, Bloomington, Columbus, Connersville, Evansville, Fort Wayne, Gary, Hammond, Indianapolis, Kokomo, Lafayette, Logansport, Madison, Marion, Muncie, Richmond, Sellersburg, South Bend, Tell City, Terre Haute, Valparaiso, and Warsaw. In addition, *selected courses* are available in Angola, Attica, Berne, Bluffton, Boonville, Clinton, Columbia City, Connersville, Crane, Crawfordsville, Delphi, Elkhart/Mishawaka, Fowler, Frankfort, Franklin, Greencastle, Huntington, Kendallville, Lawrenceburg, Liberty, Linton, Marion, Monticello, Mount Vernon, Princeton, Rushville, Warsaw, and Washington.

**ASSOCIATE IN APPLIED SCIENCE DEGREE program****TECHNICAL COURSES (50 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
0510	Data Processing Fundamentals	5
0520	COBOL Programming Fundamentals	5
0522	Problem-Solving Fundamentals	3
0530	Advanced COBOL Programming	5
0531	Operating Systems	5
0540	Systems Analysis and Design	4
0560	Data Communications	4
	Electives - Programming Courses	19

**GENERAL EDUCATION COURSES (20 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8203	Technical Mathematics 1	4
8401	Human Relations	4

**REGIONALLY DETERMINED ELECTIVES (30 Credits)**

Electives (See Course Descriptions section)

	<u>30</u>
<b>Total credits</b>	<b>100</b>

## INFORMATION/DATA MANAGEMENT (Pending approval)

The program is a user-oriented program which utilizes microcomputer technology within the modern automated office setting. Demand for employees with computer and business skills is particularly high in small and medium-sized firms which create, transmit, and control information by using microcomputers (independent or network configurations) as a management tool.

Office automation systems allow for the productive integration of combinations of several functionally related computerized subsystems such as word processing, spread sheeting, BASIC programming, electronic mail systems, electronic filing, graphics generation, and telecommunications. These systems may be stand-alone, shared logic, distributed or integrated.

The Associate in Applied Science Degree is awarded upon successful completion of 90 credit hours. The Technical Certificate is earned by successful completion of 45 credit hours.

*Programs* are pending approval in South Bend, Fort Wayne, Kokomo, Terre Haute, Indianapolis, and Evansville.

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (46 Credits)

Course #	Course Title	Credits
0110	Accounting Principles 1	4
0120	Accounting Principles 2	4
0323	Business Principles and Organization	3
0510	Data Processing Fundamentals	5
0522	Problem-Solving Fundamentals	3
0540	Systems Analysis and Design	4
0560	Data Communications	4
0568	BASIC Language Programming	4
0601	Office Automation	3
0603	Micro/Minicomputer Operating Systems	4
0605	Microcomputer Database Design and Management	4
0607	Productivity Software Applications	4

### GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (24 Credits)

Electives (See Course Descriptions section)	<u>24</u>
Total credits	90

**HOTEL-MOTEL MANAGEMENT (HOSPITALITY)**

Courses develop both managerial and technical skills in the areas of hospitality management, front office administration, food and beverage management, service, purchasing and control, sales, and maintenance. Related courses are available in accounting, supervision, communications, and mathematics.

A two-year program, requiring 90 credits, leads to an Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center concerning specific courses and the programs offered.

*Programs and courses are offered in Indianapolis. Selected courses are available in Evansville and Sellersburg.*

**ASSOCIATE IN APPLIED SCIENCE DEGREE program**

TECHNICAL COURSES (37 Credits)

Course #	Course Title	Credits
0711	Hospitality Management	4
0712	Front Office Procedures	4
0733	Food and Beverage Management and Service	4
0742	Food and Beverage Purchasing and Control	4
0744	Sanitation	4
0752	Sales Promotion	4
0760	Hotel-Motel Maintenance 1	3
0762	Supervisory Housekeeping	4
0763	Hotel-Motel Maintenance 2	3
3444	Introduction to Food Service	3

GENERAL EDUCATION COURSES (24 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4
8213	Mathematics of Finance 1	4
8401	Human Relations	4

REGIONALLY DETERMINED ELECTIVES (29 Credits)

Electives (See Course Descriptions section)	<u>29</u>
Total credits	90

## QUALITY CONTROL TECHNOLOGY

The program prepares students to enter the quality control field. Areas of study include statistical concepts and skills, development and use of sampling plans and control charts, measurement systems, non-destructive testing, reliability techniques, quality control procurement practices, and basic management principles. Graduates are eligible to take the American Society of Quality Control examination, which leads to certification as a quality control technician. It also offers employed persons the opportunity to upgrade skills.

The quality control technician, under professional direction, analyzes and solves quality control problems, performs laboratory procedures, tests products and equipment, and prepares recommendations and reports to management.

A two-year program, requiring 90 credits, leads to an Associate in Applied Science Degree. A one-year Technical Certificate is also offered.

The *program* and courses are offered in Indianapolis and Muncie. *Selected courses* are available in Kokomo, Logansport, and South Bend

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (53 Credits)

Course #	Course Title	Credits
0901	Quality Control Concepts and Techniques 1	4
0902	Quality Control Concepts and Techniques 2	4
0903	Quality Control Engineering Principles and Techniques	4
0904	Statistical Concepts and Techniques	4
0905	Quality Control Engineering Theory and Applications	4
0907	Reliability Objectives	4
0908	Non-destructive Tests	4
0909	Mechanical Metrology	4
0913	Techniques of Supervision I	3
0915	Electrical Metrology	4
0916	Procurement Quality Control	4
0917	Reliability Techniques	4
0967	Drafting and Manufacturing Standards	3
9414	Blueprint Reading I	3

### GENERAL EDUCATION COURSES (23 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8203	Technical Mathematics 1	4
8204	Technical Mathematics 2	4
8210	Statistics	3
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (14 Credits)

Electives (See Course Descriptions section)	14
Total credits	90

## **STATISTICAL PROCESS QUALITY CONTROL TECHNOLOGY (Pending Approval)**

The program provides students the opportunity to enter the quality control field with application knowledge of the latest concepts in the process of quality control. The quality control technician, through application of statistical process quality control technology, may advance to supervision or related manufacturing support functions. It also offers employed persons the opportunity to upgrade skills.

Areas of study consist of courses in quality control, manufacturing science data processing, math, science, and human relations. The emphasis is placed upon advanced statistical concepts, data collection and presentation, machine and process capabilities, advanced measurement systems utilizing computer readout, control of purchased component quality, and the integration of software and mainframe computers for optimum data analysis.

A two-year program, requiring 90 credits, leads to an Associate in Applied Science Degree. A one-year Technical Certificate is also offered.

The *program* and courses are pending approval to be offered in Fort Wayne.

## **ASSOCIATE IN APPLIED SCIENCE DEGREE program**

### **TECHNICAL COURSES (47 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
0571	Survey of Business Data Processing	3
0801	Statistical Process Control	3
0803	Advanced Statistical Process Control	3
0805	Statistical Process Control Applications	3
0807	Process Control Gauging and Measurement	3
0809	Employee Participation Techniques and Quality Improvement	3
0901	Quality Control Concepts and Techniques 1	4
0913	Techniques of Supervision 1	3
0916	Procurement Quality Control	4
0941	Labor Relations	3
0950	Manufacturing Costs and Value Analysis	3
0960	Economics of Industry	3
7521	Industrial Processes and Systems	3
7731	Basic Print Reading	3
7762	Precision Measurement	3

### **GENERAL EDUCATION COURSES (25 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
8110	Communications	4
8113	Oral Communications	4
8203	Technical Mathematics 1	4
8209	Trigonometry	3
8210	Statistics	3
8301	Physical Science	3
8401	Human Relations	4

### **REGIONALLY DETERMINED ELECTIVES (18 Credits)**

Electives (See Course Descriptions section)

	<u>18</u>
<b>Total credits</b>	<b>90</b>

## INDUSTRIAL SUPERVISION TECHNOLOGY

The program provides formal training in supervising techniques and principles. Students learn how to set goals, plan, organize, staff, direct, motivate, and control operations in an industrial setting. These skills are applied to supervision, quality control, production control, safety, and methods improvement. Emphasis is placed on team building and employee in-service training.

The program prepares students for entry-level supervisory positions in manufacturing, the service industry, and government agencies.

A two-year program, requiring 90 credits, leads to an Associate in Applied Science Degree. A one-year Technical Certificate is also offered.

*Programs* and courses are offered in Anderson, Evansville, Fort Wayne, Indianapolis, Marion, Muncie, South Bend, and Warsaw. In addition, *selected courses* are available in Angola, Attica, Berne, Bloomington, Bluffton, Boonville, Brownsburg, Columbia City, Columbus, Crane, Crawfordsville, Delphi, Elkhart/Mishawaka, Fowler, Frankfort, Franklin, Gary, Greenfield, Grissom Air Force Base, Hammond, Huntington, Kendallville, Kokomo, Lebanon, Logansport, Madison, Martinsville, Monticello, Mount Vernon, Princeton, Richmond, Sellersburg, Tell City, Terre Haute, Valparaiso, and Washington.

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (32 Credits)

Course #	Course Title	Credits
0112	Accounting for Non-Majors	4
0122	Business Law 1	3
0154	Macroeconomics	3
0571	Survey of Business Data Processing	3
0901	Quality Control Concepts and Techniques 1	4
0913	Techniques of Supervision 1	3
0921	Industrial Safety	3
0923	Techniques of Supervision 2	3
0941	Labor Relations	3
0951	Production Planning and Control	3

### GENERAL EDUCATION COURSES (19 Credits)

Course #	Course Title	Credits
8110	Communications	4
8113	Oral Communications	4
8203	Technical Mathematics 1	4
8210	Statistics	3
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (39 Credits)

Electives (See Course Descriptions section)	39
Total credits	90



## **SECRETARIAL SCIENCES**

### **(Administrative, Medical, Legal, and Word Processing Options)**

The program provides training in typing, word processing, shorthand, filing, mathematics, accounting, communications, office management, operation of various types of office equipment, and other skills necessary for success in the secretarial field. Program options offer further training in several specialized areas.

The **ADMINISTRATIVE** Secretarial option trains the student to organize and execute general office responsibilities, ranging from records management and correspondence to statistical research and report preparation.

The **MEDICAL** Secretarial option emphasizes medical office administrative and clerical duties, including scheduling appointments, obtaining patient information, arranging hospital admissions, ordering supplies, billing, and completing insurance forms.

The **LEGAL** Secretarial program teaches the student to conduct legal research and to assist in the preparation of briefs. It also offers training in legal bookkeeping and typing, legal office practice and procedures, and business law.

**WORD PROCESSING**, the newest option, offers training on sophisticated equipment in the secretarial labs. Because most businesses with recently installed word processing machines do not offer in-house training, employers prefer to hire those who already possess skills in using this equipment. Ivy Tech provides its students with the training needed to be competitive in this job market.

*Programs* and courses are offered in Anderson, Bloomington, Columbus, Connersville, Evansville, Fort Wayne, Gary, Hammond, Indianapolis, Kokomo, Lafayette, Lawrenceburg, Logansport, Madison, Muncie, Richmond, Sellersburg, South Bend, Tell City, Terre Haute, Valparaiso, and Warsaw. In addition, *selected courses* are available in Angola, Attica, Berne, Bluffton, Boonville, Brownsburg, Columbia City, Crane, Crawfordsville, Danville, Delphi, Elkhart/Mishawaka, Fowler, Frankfort, Greenfield, Grissom Air Force Base, Huntington, Kendallville, Lebanon, Linton, Marion, Martinsville, Monticello, Mount Vernon, Princeton, Washington, and Westfield.



## SECRETARIAL SCIENCES - ADMINISTRATIVE Option

This option trains the student to organize and execute general office responsibilities, ranging from records management and correspondence to statistical research and report preparation. The program emphasizes typing, word processing, shorthand, records management, work organization, telephone procedures, office management skills, office equipment operation, public relations, math, bookkeeping, and communications.

A two-year program, requiring 92 credits, leads to an Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (44 Credits)

Course #	Course Title	Credits
0122	Business Law 1	3
1210	Shorthand 1	4
1212	Typewriting 1	4
1220	Shorthand 2	4
1222	Typewriting 2	4
1224	Records Management	3
1230	Shorthand 3	4
1232	Typewriting 3	4
1236	Office Calculating Machines	3
1241	Clerical Office Procedures	3
1242	Typewriting 4	4
1262	Typewriting 5	4
	(or 1255 Word Processing Fundamentals)	

### GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (28 Credits)

Electives (See Course Descriptions)	<u>28</u>
Total Credits	92

## SECRETARIAL SCIENCES - LEGAL Option

The legal secretarial option trains the student to conduct legal research and to assist the lawyer in preparing briefs. Training in legal bookkeeping and typing, legal office practice and procedures, and business law is included. The program also develops skills in typing, shorthand, filing, math, accounting, communications, office management, and the operation of various pieces of office equipment.

A one-year program, requiring 60 credits, leads to a Technical Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL CERTIFICATE Program

#### TECHNICAL COURSES (30 Credits)

Course #	Course Title	Credits
0122	Business Law 1	3
0143	Business Law 2	3
1212	Typewriting 1	4
1222	Typewriting 2	4
1232	Typewriting 3	4
1267	Machine Dictation & Transcription	2
1310	Legal Terminology	2
1321	Legal Office Procedures	4
1342	Typewriting 4 - Legal	4

#### GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4
8401	Human Relations	4

#### REGIONALLY DETERMINED ELECTIVES (10 Credits)

Electives (See Course Descriptions)	10
Total Credits	60

## SECRETARIAL SCIENCES - MEDICAL Option

The Medical Secretarial option prepares the student for administrative and clerical duties in medical offices. Training includes scheduling appointments, obtaining patient information, arranging hospital admissions, ordering supplies, billing, completing insurance forms, and other tasks related to the medical office. The program also includes training in typing, shorthand, filing, math, accounting, communications, and office management, and the operation of various pieces of office equipment.

A one-year program, requiring 60 credits, leads to a Technical Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL CERTIFICATE Program

#### TECHNICAL COURSES (18 Credits)

Course #	Course Title	Credits
1212	Typewriting 1	4
3721	Medical Office Procedures - Administrative	4
3722	Medical Typewriting 1	3
3732	Medical Office Communications	4
3743	Machine Transcription - Medical 1	3

#### GENERAL EDUCATION COURSES (12 Credits)

Course #	Course Title	Credits
8110	Communications	4
8212	Business Mathematics	4
8401	Human Relations	4

#### REGIONALLY DETERMINED ELECTIVES (30 Credits)

Electives (See Course Descriptions)	<u>30</u>
Total Credits	60

## SECRETARIAL SCIENCES - WORD PROCESSING Option

This option emphasizes secretarial skills utilizing advanced technological equipment. Students learn to produce, edit, format, and print written communications with the aid of word processing technology. The program includes training in the application and supervision of word processing operations and word processing files, equipment selection, and work measurement. The program also includes training in typing, records management, math, accounting, communications, office management, and the operation of general office equipment.

A two-year program, requiring 92 credits, leads to an Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (32 Credits)

Course #	Course Title	Credits
1212	Typewriting 1	4
1222	Typewriting 2	4
1224	Records Management	3
1232	Typewriting 3	4
1241	Clerical Office Procedures	3
1255	Word Processing Fundamentals	4
1256	Word Processing Operations	4
1257	Word Processing Applications	4
1267	Machine Dictation and Transcription	2

### GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (40 Credits)

Electives (See Course Descriptions)	40
Total Credits	92

## MARKETING TECHNOLOGY

The program offers broad business training to prepare the student for employment opportunities in marketing operations and management. Courses include marketing, management, business law, sales techniques, retailing, public relations, advertising, accounting, and related areas in mathematics, communications, and finance.

Career opportunities may be found in supervision, advertising, distribution, professional sales, retailing, wholesaling, and manufacturing, in industrial and consumer markets, and in profit and nonprofit organizations.

A two-year program, requiring 90 credits, leads to an Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs* and courses are offered in Anderson, Evansville, Fort Wayne, Gary, Indianapolis, Kokomo, Muncie and Terre Haute. In addition, *selected courses* are available in Angola, Berne, Bluffton, Boonville, Clinton, Columbia City, Columbus, Crane, Greencastle, Grissom Air Force Base, Hammond, Huntington, Kendallville, Lawrenceburg, Linton, Logansport, Madison, Marion, Mount Vernon, Princeton, Richmond, Sellersburg, South Bend, Tell City, Valparaiso, and Washington.

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (28 Credits)

Course #	Course Title	Credits
0112	Accounting for Non-Majors	4
1114	Marketing 1	4
1115	Sales Techniques	4
1116	Marketing 2	4
1135	Retailing	4
1136	Physical Distribution	4
1147	Advertising	4

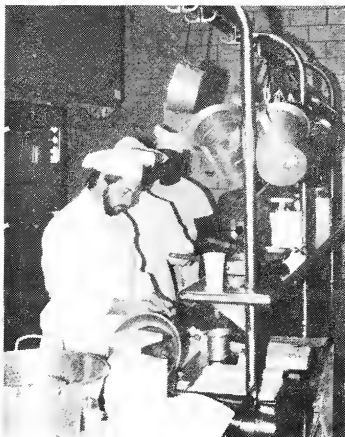
### GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (42 Credits)

Electives (See Course Descriptions)

	42
Total Credits	90



## CULINARY ARTS TECHNOLOGY

The program familiarizes students with the culinary styles of outstanding chefs and experienced instructors. Students learn food techniques and uses of many types of equipment. In each course the students participate in food preparation, giving special attention to personal hygiene, food handling techniques, sanitation, and safety regulations. The program covers food, beverage, and volume food service, menu planning, international food preparation, classical cuisine, baking and pastries, wines and spirits, meat cutting, and fish and seafood preparation. An externship program may be available on a regional basis to offer students on-the-job training as employees of local food service businesses.

A two-year program, requiring 96 credits, leads to an Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs* and courses are offered in Fort Wayne, Hammond, and Indianapolis. In addition, *selected courses* are available in Angola, Berne, Bluffton, Columbia City, Huntington, and Kendallville.

## ASSOCIATE IN APPLIED SCIENCE DEGREE Program

### TECHNICAL COURSES (48 Credits)

Course #	Course Title	Credits
3411	Culinary Arts	2
3413	Introduction to Foods	2
3415	Baking Fundamentals	3
3416	Culinary Theory and Skills Development	3
3417	Pantry and Breakfast Cookery	2

3421	Nutrition	3
3423	Introductory Hot Food Preparation	3
3425	Table Service	2
3426	Purchasing, Storeroom Procedures, and Stewarding	2
3427	Institutional Food Service Systems	2
3428	Intermediate Hot Food Preparation	2
3430	Meat Cutting/Kitchen	3
3436	Advanced Baking/Classical Pastry	3
3440	International Food Preparation	3
3442	Buffet Catering	2
3459	Classical Cuisine and Banquet Organization	3
3461	A la Carte Food Preparation and Advanced Table Service	3
3462	Advanced Food Preparation and Banquet Service	3
3474	First Aid/Sanitation	2

GENERAL EDUCATION COURSES ( 12 Credits)

Course #	Course Title	Credits
8110	Communications	4
8212	Business Mathematics	4
8401	Human Relations	4

REGIONALLY DETERMINED ELECTIVES ( 36 Credits)

Electives	<u>36</u>
Total Credits	96

# **DIVISION OF VISUAL COMMUNICATIONS TECHNOLOGIES**

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The Division of Visual Communications Technologies offers opportunities to combine creative talent with practical applications. Hands-on instruction encourages originality, technical development, and familiarity with sophisticated equipment in the graphics and media field. Courses are structured to give a broad understanding of principles and to develop the skills needed for their efficient and effective application.

The Division offers two-year programs leading to the Associate in Applied Science Degree. The Division also offers a one-year Technical Certificate. All courses offered in the Visual Communications program are available as "courses only" to students not enrolled in the program. The student is advised to contact the nearest center concerning specific courses and program offerings.



## AUDIOVISUAL COMMUNICATIONS TECHNOLOGY

The program offers training in audiovisual communications, commercial photography, commercial art, and audiovisual electronics, preparing students for initial employment or upgrading of their skills in the field. The curriculum includes courses in radio and television, sound systems, audiovisual production, audiovisual equipment use and maintenance, visual arts, and photography.

The audiovisual communications technician is trained to produce software for AV systems in industry, government, and educational institutions and to operate and maintain commonly used AV equipment.

The two-year program, requiring 105 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to consult the nearest center concerning specific courses and program offerings.

*Programs and courses are offered in South Bend. In addition, selected courses are available in Gary and Terre Haute.*

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (53 Credits)

Course #	Course Title	Credits
1808	Portfolio Preparation 1	3
1858	Storyboard Techniques	2
1861	Storyboard Concepts	2
1901	Audio Production	2
1902	Video Production 1	3
1903	Video Production 2	3
1904	Audiovisual Electronics	2
1905	Video Systems Design	2
1906	Script Writing for TV 1	2
1907	Script Writing for TV 2	2
1913	Advanced Color Video Production	4
1914	Advanced Audio Production	2
1942	Videotape Production	3
1953	Color Videotape Production	3
1961	Videotape Editing	2
1983	Special Effects in Color	4
1984	Advanced VTR Production	4
1985	Multitrack Sound Systems	3
1988	Sound Recording and Editing	3
1989	Audiovisual Equipment Utilization and Maintenance	2

### REQUIRED GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8401	Human Relations	4
8403	Psychology of Advertising	4

### REGIONALLY DETERMINED ELECTIVES (32 Credits)

Electives (See Course Descriptions)

	32
Total Credits	105

## COMMERCIAL AND INDUSTRIAL PHOTOGRAPHY TECHNOLOGY

The program emphasizes the development of technical skills, ranging from camera to darkroom. Courses are offered in photography fundamentals or theory, photographic materials, lighting and setup techniques, darkroom techniques, product photography, composition and design, color and black and white processes, portraiture, and specialized commercial photography.

A two-year program, requiring 105 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered.

*Programs* and courses are offered in Columbus, Evansville, South Bend, and Terre Haute. In addition, *selected courses* are available in Greencastle and Indianapolis.

### ASSOCIATE IN APPLIED SCIENCE DEGREE program

#### TECHNICAL COURSES (41 Credits)

Course #	Course Title	Credits
1614	Photography 1	2
1615	Photographic Science and Theory 1	3
1616	Studio Practice 1	2
1624	Photography 2	2
1625	Photographic Science and Theory 2	3
1626	Studio Practice 2	2
1627	Darkroom Techniques 1	2
1628	Darkroom Techniques 2	3
1634	Sequential Photography	3
1635	Product Photography	3
1636	Studio Practice 3	2
1638	Darkroom Techniques 3	2
1642	Industrial and Commercial Techniques 1	2
1645	Photographic Composition	3
1652	Industrial and Commercial Techniques 2	3
1663	Color Portraiture	2
1665	Custom Color Printing	2

#### GENERAL EDUCATION COURSES ( 20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4
8403	Psychology of Advertising	4

#### REGIONALLY DETERMINED ELECTIVES (44 Credits)

Electives (See Course Descriptions)

	44
Total Credits	<u>105</u>

## COMMERCIAL ART TECHNOLOGY

Commercial artists perform many tasks involving the use of art media to produce illustrations, graphic designs, advertising layouts, fashion drawings, product drawings, and display and package designs for the advertising field. The production artist's task is to prepare art for printing and photographic reproduction.

The program includes courses in drawing, composition and design, illustration media and techniques, visual arts, communications, typography, photography, copywriting, layout, life drawing, airbrush retouching, storyboard techniques, and portfolio preparation.

The two-year program, requiring 105 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs* and courses are offered in Columbus, Evansville, Sellersburg, and South Bend. In addition, *selected courses* are available in Elkhart/Mishawaka.

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (51 Credits)

Course #	Course Title	Credits
1810	Composition and Design Fundamentals	2
1812	Drawing Fundamentals	2
1814	Drawing Techniques 1	2
1815	Composition and Design Techniques 1	2
1816	Illustration Techniques 1	2
1820	Composition and Design Techniques 2	2
1822	Drawing Techniques 2	2
1824	Typography Techniques	2
1825	Creative Typography	3
1830	Typographic Theory	3
1831	Black and White Illustration	2
1834	Black and White Media Techniques	2
1840	Layout Design Fundamentals 1	2
1842	Layout Design Techniques 1	2
1847	Keylining Fundamentals 1	2
1850	Layout Design Fundamentals 2	2
1854	Layout Design Techniques 2	2
1858	Storyboard Techniques	2
1860	Keylining Techniques 1	2
1869	Darkroom Processes	2
1872	Keylining Techniques 2	2
1883	Specialized Layout Concepts	2
1884	Specialized Layout Techniques	2
1885	Portfolio Preparation 1	3

### GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8401	Human Relations	4
8403	Psychology of Advertising	4

### REGIONALLY DETERMINED ELECTIVES (34 Credits)

Electives (See Course Descriptions)

	<u>34</u>
Total Credits	105

## INTERIOR DESIGN TECHNOLOGY

Interior designers create interior environments for proposed and existing structures. The selection of furniture, equipment, and accessories is an integral part of the design process. A designer may work on residential or commercial interiors or in theatrical set design.

The program offers courses in composition and design, color theory, art history, structural design, interior design, textiles, communications, and human relations. The program prepares students for initial employment or for upgrading skills in current employment.

A two-year program, requiring 96 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs and courses are offered in Evansville, Kokomo, and South Bend. In addition, selected courses are available in Elkhart/Mishawaka and Muncie.*

### ASSOCIATE IN APPLIED SCIENCE DEGREE program

#### TECHNICAL COURSES (38 Credits)

Course #	Course Title	Credits
2010	Composition and Design 1	3
2013	Structural Design 1	4
2020	Composition and Design 2	3
2021	Textiles 1	3
2022	Interior Design 1	3
2023	Structural Design 2	3
2031	Textiles 2	3
2032	Furniture Styles 1	3
2033	Furniture Styles 2	3
2050	Applied Interior Design 1	4
2052	Professional Practices	3
2053	Furniture Arrangements and Space Planning	3

#### GENERAL EDUCATION COURSES (12 Credits)

Course #	Course Title	Credits
8110	Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4

#### REGIONALLY DETERMINED ELECTIVES (46 Credits)

Electives (See Course Descriptions)	46
Total Credits	96

## PRINTING TECHNOLOGY

The program offers training in art and camera preparation, camera and darkroom fundamentals, layout and stripping flats, platemaking, offset presswork, composition, press troubleshooting, production control, special effects, and ink and paper selection for offset.

A two-year program, requiring 101 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs* and courses are offered in Terre Haute. *Selected courses* are available in Columbus, Greencastle, and South Bend.

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (63 Credits)

Course #	Course Title	Credits
2210	Type Composition for Reproduction	2
2211	Art and Copy Preparation	2
2212	Layout and Stripping Flats	2
2213	General Printing Process	2
2214	Camera Fundamentals	2
2215	Plate-Making Fundamentals	2
2216	Offset Presswork Fundamentals	3
2221	Camera Line and Halftone	2
2222	Stripping Line and Halftone Negative	2
2223	Photo Offset Fundamentals	2
2224	Printing Estimating	3
2225	Offset Presswork 1	3
2231	Advanced Camera	2
2232	Offset Presswork Operations	2
2233	Offset Presswork 2	3
2240	Special Effect Camera Work	2
2241	Printing Production Practice	2
2242	Press Troubleshooting	2
2243	Offset Presswork 3	3
2244	Ink and Paper for Offset	2
2251	Special Problems in Offset Preparation	3
2252	Manufacturing and Organization	3
2255	Printing Specialization	4
2262	Production Controls	3
2263	Phototypesetting	3
2264	Preventive Maintenance	2

### GENERAL EDUCATION COURSES (21 Credits)

Course #	Course Title	Credits
8110	Communications	4
8113	Oral Communications	4
8114	Technical Reporting	3
8201	Applied Mathematics 1	4
8401	Human Relations	4
8406	Employment Orientation	2

### REGIONALLY DETERMINED ELECTIVES (17 Credits)

Electives (See Course Descriptions)

	17
Total Credits	101

## LIBRARY RESOURCE AIDE

The library resource aide supports and assists librarians by performing such duties as checking materials in and out, processing new materials for use, filing cards in the card catalogue, answering simple reference questions, operating audiovisual equipment, typing catalogue cards and orders, and keeping magazine records.

The program offers courses in the fundamentals of library operation, library forms and records, audiovisual equipment operation, audiovisual production, typing, communications and human relations. The program also includes a field project in a cooperating library.

A one-year program, requiring 45 credits, leads to a Technical Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs and courses are available in Indianapolis.*

## TECHNICAL CERTIFICATE Program

### TECHNICAL COURSES (24 Credits)

Course #	Course Title	Credits
2415	Audiovisual Equipment Operation and Maintenance	3
2417	Library and Learning Resource Center Fundamentals 1	3
2418	Library and Learning Resource Center Fundamentals 2	3
2419	Library Forms and Records	3
2427	Library Operations and Practices	5
8501	Field Study/Cooperative Education	7

### GENERAL EDUCATION COURSES (8 Credits)

Course #	Course Title	Credits
8110	Communications	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (13 Credits)

Electives (See Course Descriptions)	<u>13</u>
Total Credits	45

# DIVISION OF HUMAN SERVICES AND HEALTH TECHNOLOGIES

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The Division of Human Services and Health Technologies recognizes the increasing employment opportunities in the expanding health field. Ivy Tech prepares students to become technically trained members of the health care team. Classroom, laboratory, and clinical training prepare students for service in hospitals, laboratories, nursing homes, child-care facilities, doctors' offices, and other health care-related settings.

College health occupation programs are recognized and accredited by appropriate external accrediting agencies. The student is advised to contact the nearest center for information concerning programs and course offerings.

## CHILD CARE TECHNOLOGY

The program focuses on early childhood growth and development and on adult-child relationships. Emphasis is placed on the skillful handling of groups of young children. Instruction is provided in all areas of the preschool curriculum and the student also observes and participates in parent/teacher groups. Field experiences lead the student from the level of an observer to that of a supervised student teacher.

The two-year program, requiring 98 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs and courses are offered in Fort Wayne, Muncie, and Richmond. In addition, selected courses are available in Angola, Berne, Bluffton, Columbia City, Columbus, Huntington, Indianapolis, Kendallville, Kokomo, and Logansport.*

ASSOCIATE IN APPLIED SCIENCE DEGREE program

TECHNICAL COURSES (86 Credits)

Course #	Course Title	Credits
0323	Business Principles and Organization	3
2601	Child Care	4
2610	Child Growth and Development	4
2612	Childhood Health	3
2623	Cognitive and Creative Activities	3
2624	Child Care Participation 1	4
2625	Legal Aspects of Child Care	3
2626	Science and Social Studies for Preschool Children	4
2627	Child Care Seminar 1	2
2631	Child Care Participation 2	4
2633	Community Resources	4
2637	Child Care Seminar 2	2
2642	Nutrition and Meal Planning	4
2643	Preschool Art	4
2645	Child Care Participation 3	4
2647	Child Care Seminar 3	2
2651	Language Arts for Children	4
2654	Child Care Participation 4	4
2655	Bookkeeping	4
2657	Child Care Seminar 4	2
2660	Preschool Music	4
2661	Management Techniques	4
2663	Audiovisual Materials and Methods	4
2665	Child Care Participation 5	4
2667	Child Care Seminar 5	2

GENERAL EDUCATION COURSES (8 Credits)

Course #	Course Title	Credits
8110	Communications	4
8401	Human Relations	4

REGIONALLY DETERMINED ELECTIVES (4 Credits)

Electives (See Course Descriptions)	4
Total Credits	98



## MENTAL HEALTH REHABILITATION TECHNOLOGY

The program prepares paraprofessionals with the skills necessary for employment in the mental health field.

The program trains technicians in activity therapy, work therapy, supportive psychotherapy, and educational and recreational programs. The curriculum offers specialized and technical courses in physical and behavioral client-treatment techniques, management of client living units, recreational and creative activities, and client assessment and documentation.

The two-year program, requiring 105 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs and courses are offered in Fort Wayne and Muncie. In addition, selected courses are available in Anderson, Angola, Berne, Bluffton, Columbia City, Huntington, Indianapolis, Kendallville, and Richmond.*

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (80 Credits)

Course #	Course Title	Credits
2701	Physical Care	4
2702	Behavior Management 1	4
2704	Human Services	3
2710	Clinical 1	5
2711	Physical Systems 1	4
2712	Behavior Management 2	4
2713	Human Growth and Development 1	4
2714	Human Growth and Development 2	4
2715	Evaluation and Assessment	2
2716	Information Management	2
2717	Special Populations	3
2720	Clinical 2	5
2730	Clinical 3	5
2733	Current Issues in Mental Health	3
2734	Residential Management	4
2743	Legal Aspects of Client Treatment	4
2760	Therapeutic Recreation	4
2762	Service Delivery Systems	4
2775	Supervision	4
3766	First Aid and Emergency Care	3
9310	Pharmacology	4
9359	Cardiopulmonary Resuscitation	1

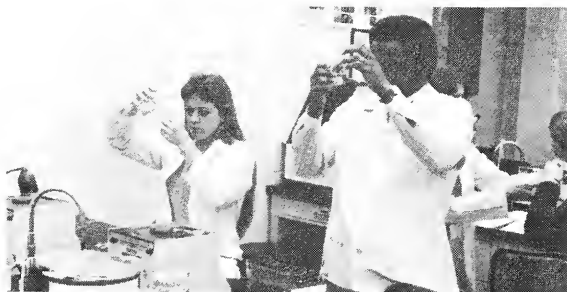
### GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8201	Applied Math I	4
8401	Human Relations	4
8402	Applied Behavioral Psychology	4
8452	Abnormal Psychology	4

### REGIONALLY DETERMINED ELECTIVES (5 Credits)

Electives (See Course Descriptions)

	5
Total Credits	105



## **MEDICAL LABORATORY TECHNICIAN**

Medical laboratory technicians (MLTs) perform laboratory procedures, define and solve associated problems, and use quality control techniques to aid in the diagnosis, treatment, and monitoring of patients. Courses in bacteriology, parasitology, chemistry, hematology, immunology, anatomy, physiology, and immunohematology provide both theory and practical applications.

Ivy Tech's program is approved by the National Accrediting Agency for Clinical Laboratory Sciences. Graduates are eligible to take one of the national registries for designation as MLT or CLT.

A two-year program, requiring 97 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is offered at Richmond Center. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs and courses are offered in Indianapolis, Lafayette, Richmond, South Bend, and Terre Haute.*

## **ASSOCIATE IN APPLIED SCIENCE DEGREE Program**

### **TECHNICAL COURSES (55 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
2811	Laboratory Techniques	4
2813	Immunohematology Techniques	4
2814	Routine Analysis Techniques	4
2820	Hematology Techniques	8
2823	Microbiology Techniques	6
2829	Parasitology and Mycology Techniques	2
2830	Chemistry Techniques	8
2832	Immunology Techniques	4
2860	Advanced Chemistry Techniques	2
2863	Instrumentation	3
9349	Anatomy and Physiology	8
9350	Medical Law and Ethics	2

## GENERAL EDUCATION COURSES (11 Credits)

Course #	Course Title	Credits
8110	Communications	4
8307	General Chemistry	3
8401	Human Relations	4

## REGIONALLY DETERMINED ELECTIVES (31 Credits)

Electives (See Course Descriptions)	31
Total Credits	97

**DENTAL ASSISTANT**

The program offers courses in dental anatomy and physiology, microbiology, pharmacology, oral pathology, dental materials, chairside assisting, recordkeeping, and typing. A large portion of the student's time is spent in clinical and laboratory work.

Dental Assistants work with dentists as they examine and treat patients. They make patients comfortable in the dental chair, prepare them for treatment, and assist at chairside. Dental assistants also prepare materials for making impressions and restorations, expose radiographs, and process X-ray film as directed by the dentist. Many assistants provide oral health instruction and prepare instruments for sterilization.

A one-year program, requiring 72 credits, leads to a Technical Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs and courses are offered in Lafayette.*

**TECHNICAL CERTIFICATE Program**

## TECHNICAL COURSES (68 Credits)

Course #	Course Title	Credits
3003	Dental Materials and Laboratory 1	4
3007	Preclinical Practice 1	5
3008	Dental Anatomy	4
3009	Health Office Communications	4
3010	Dental Materials and Laboratory 2	4
3011	Preclinical Practice 2	5
3012	Oral Pathology/Microbiology	4
3013	Preventive Dentistry/Diet and Nutrition	3
3034	Dental Radiography	5
3038	Clinical Practice 1	2
3039	Dental Office Management	4
3042	First Aid for the Dental Assistant	4
3044	Clinical Practice 2	11
3045	Pharmacology for the Dental Assistant	1
9349	Anatomy and Physiology	8

## GENERAL EDUCATION COURSES (4 Credits)

Course #	Course Title	Credits
8401	Human Relations	4
Total Credits		72

## FOOD SERVICE TECHNOLOGY

The program prepares students for careers in regional or national food chains or in health care facilities and institutions. Students are trained to select, purchase, prepare, and produce food in quantity. Included are courses in volume purchasing and preparation of foods, supervision of food service operations, sanitation and safety, operation and maintenance of production and service equipment, recipe development, preparation and scheduling of food production and proper service techniques, and marketing and merchandising of the establishment and the product. Student may elect courses in nutrition, cost controls, beverage management, bakery products, and catering.

A one-year program, requiring 48 credits, leads to a Technical Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

The *program* and courses are offered in Richmond.

### TECHNICAL CERTIFICATE Program

#### TECHNICAL COURSES (33 Credits)

Course #	Course Title	Credits
2901	Food Preparation Fundamentals	4
2902	Beverage Management	2
2903	Marketing in Food Service	3
2904	Restaurant Supervisor	4
3414	Volume Food Service	3
3422	Volume Food Preparation	5
3451	Introduction to Food Service	3
3452	Food Service 1	3
3457	Purchasing Procedures	3
3460	Equipment Maintenance	3

#### GENERAL EDUCATION COURSES (12 Credits)

Course #	Course Title	Credits
8110	Communications	4
8212	Business Mathematics	4
8401	Human Relations	4

#### REGIONALLY DETERMINED ELECTIVES (3 Credits)

Electives	3
Total Credits	<u>48</u>

## DIETARY MANAGER

The program prepares the student for initial employment in the food service field. Included are courses in nutrition, diet therapy, personnel management, sanitation, cost control, and food preparation. Opportunities are provided for practical experience under the supervision of registered dietitians. The program meets the requirements of the Dietary Managers Association and the Indiana State Board of Health.

A one-quarter program, requiring 16 credits, leads to an Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs* and courses are offered in Fort Wayne, Gary, and South Bend. *Selected courses* are available in Warsaw.

## OCCUPATIONAL CERTIFICATE Program

### TECHNICAL COURSES (16 Credits)

Course #	Course Title	Credits
3607	Nutrition and Diet Therapy	5
3608	Dietary Management 1	5
3609	Dietary Management 2	5
3612	Nutrition Diet Therapy - Practicum	1
Total Credits		16

## MEDICAL ASSISTANT

The program provides training in medical office procedures, medical terminology, medical typing and transcription, medical insurance, and anatomy and physiology. Externships are required in the clinical and administrative areas. Graduates may sit for the National Certification Examination. The program is accredited by the American Association of Medical Assistants and the American Medical Association.

A two-year program, requiring 101 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs and courses are offered in Columbus, Fort Wayne, Evansville, Gary, Indianapolis, Kokomo, Lafayette, Madison, Muncie, South Bend, Terre Haute, and Westville. In addition, selected courses are available in Angola, Berne, Bluffton, Boonville, Columbia City, Crane, Huntington, Kendallville, Lawrenceburg, Logansport, Mount Vernon, Princeton, Richmond, Tell City, Valparaiso, and Washington.*

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (83 Credits)

Course #	Course Title	Credits
3712	Medical Office Procedures - Clinical 1	4
3713	Medical Office Bookkeeping	4
3719	Medical Typewriting	3
3721	Medical Office Procedures - Administrative	4
3729	Medical Assistant Clinical Externship	4
3730	Medical Assistant Laboratory Techniques	4
3732	Medical Office Communications	4
3742	Medical Office Procedures - Clinical 2	4
3743	Machine Transcription - Medical 1	3
3744	Machine Transcription - Medical 2	3
3752	Medical Office Procedures - Clinical 3	4
3761	Community Health	2
3763	Medical Office Management	3
3766	First Aid and Emergency Care	3
3769	Medical Assistant Administrative Externship	4
3771	Medical Insurance	3
4406	Holistic Approach to Health	2
9310	Pharmacology	4
9349	Anatomy and Physiology	8
9350	Medical Law and Ethics	2
9355	Medical Terminology	4
9356	Disease Conditions	6
9359	Cardiopulmonary Resuscitation	1

### GENERAL EDUCATION COURSES (7 Credits)

Course #	Course Title	Credits
8111	Business Communications	4
8308	General Microbiology	3

### REGIONALLY DETERMINED ELECTIVES (11 Credits)

Electives (See Course Descriptions)

	11
Total Credits	101

## HUMAN SERVICES TECHNOLOGY

The program prepares students to work as paraprofessionals in various social, community, and educational service agencies. The paraprofessional utilizes a knowledge of human behavior, group dynamics, and psychosocial processes to work effectively with specific populations. In a broad sense, human services form a part of educational programs; developmental disabilities services; mental health, recreation, and child care programs; services for the elderly; alcohol and drug rehabilitation programs; criminal justice and correctional programs; and nonprofit organizations.

The program provides extensive field experience in addition to classroom studies in the areas of child care and care of the elderly. Courses include child growth and development, human services, childhood movements and creative activity, group leadership and group process, techniques of client treatment, psychology of aging and death, recreational programming for the elderly, and community resources.

The two-year program, requiring 90 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

The *program* is offered in Indianapolis.

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (47 Credits)

Course #	Course Title	Credits
2633	Community Resources	2
2702	Motivation and Learning	4
4010	Human Services 1	4
4020	Human Services 2	3
4032	Helping Relationship Techniques	4
4034	Interviewing and Counseling	4
4041	Directed Practice 1	6
4050	Group Process and Skills	4
4051	Directed Practice 2	4
4060	Program Planning and Evaluation	4
4061	Directed Practice 3	4
4065	Human Services Topical Seminar	4

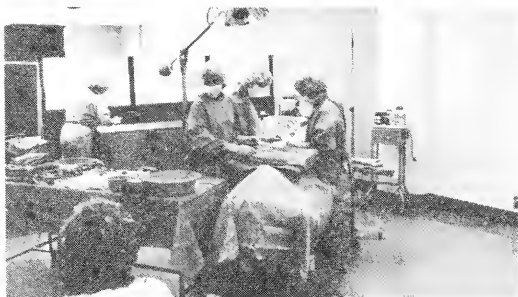
### GENERAL EDUCATION COURSES (23 Credits)

Course #	Course Title	Credits
8110	Communications	4
8113	Oral Communications	4
8117	Effective Listening	2
8401	Human Relations	4
8402	Applied Behavioral Psychology	4
8405	Social Problems	4
9359	Cardiopulmonary Resuscitation	1

### RESTRICTED ELECTIVES (20 Credits)

Electives (See Course Descriptions)

	<u>20</u>
Total Credits	90



## SURGICAL TECHNOLOGY

The program offers courses in surgical techniques, anatomy physiology, pharmacology, microbiology, medical law and ethics, and clinical and surgical procedures. Part of the program is taught in the hospital setting. Graduates are eligible to become certified surgical technologists.

A one-year program, requiring 75 credits, leads to a Technical Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs* and courses are offered in Gary, Indianapolis, Lafayette, and Westville. In addition, *selected courses* are available in Sellersburg and South Bend.

## TECHNICAL CERTIFICATE Program

### TECHNICAL COURSES (69 Credits)

Course #	Course Title	Credits
4211	Surgical Techniques 1	10
4221	Surgical Procedures 1	5
4222	Clinical Applications 1	8
4230	Surgical Procedures 2	5
4231	Clinical Applications 2	10
4240	Clinical Applications 3	10
4242	Surgical Procedures 3	4
9349	Anatomy and Physiology	8
9350	Medical Law and Ethics	2
9355	Medical Terminology	4
9358	Pharmacology	3

### GENERAL EDUCATION COURSES (3 Credits)

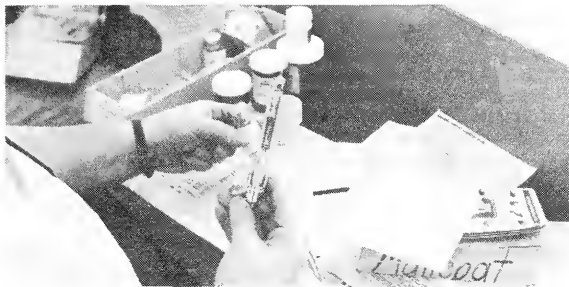
Course #	Course Title	Credits
8308	General Microbiology	3

### REGIONALLY DETERMINED ELECTIVES (3 Credits)

Electives (See Course Descriptions)

	<u>3</u>
Total Credits	75





## NURSING

Ivy Tech offers two levels of nurses training – the Practical Nurse (PN) program and the Associate Degree Nursing program (ADN). The two programs are based on the career ladder concept: a student may complete the PN program, work for a period of time, then enroll for further training at the Associate Degree level.

### PRACTICAL NURSING (PN) Program

Graduates of the PN program are eligible to take the state examination to become licensed as practical nurses. The one-year program, requiring 74 credits, leads to a Technical Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

PN programs are available in Bloomington, Columbus, Fort Wayne, Gary, Indianapolis, Lafayette, Madison, Richmond, South Bend, Terre Haute, and Westville.

### PRACTICAL NURSING (PN) Program

#### TECHNICAL COURSES (74 Credits)

Course #	Course Title	Credits
4401	Foundations of Nursing	3
4402	Collecting, Reporting, and Recording Patient Data	3
4403	Therapeutic Measures	6
4406	Holistic Approach to Health	2
4407	Nutrition	2
4408	Oncologic Nursing	1
4412	Endocrine Nursing	2
4415	Cardiovascular Nursing	2
4416	Gastrointestinal Nursing	2
4419	Respiratory Nursing	2
4425	Musculoskeletal and Neurological Nursing	2
4426	Genitourinary Nursing	2
4434	Intravenous Therapy	2
4437	Dermatologic and E.E.N.T. Nursing	1
4438	Gerontology	2
4440	Maternal Health Nursing	3
4449	Practical Nurse in Today's Society	2

4453	Pediatric Nursing	3
9310	Pharmacology	4
9349	Anatomy and Physiology	<u>8</u>

NOTE: A minimum of 17 of the 20 credits must be obtained with the following distribution: Medical Surgical Clinical Nursing - 13 credits, Pediatric Clinical Nursing - 2 credits, and Maternal Clinical Nursing - 2 credits.

Regionally Determined Electives (20 credits)

Course #	Course Title	Credits
4423	Medical Surgical Clinical Nursing 1	7
4432	Medical Surgical Clinical Nursing 2	7
4439	Geriatric Clinical Nursing	3
4442	Maternal Clinical Nursing	4
4454	Pediatric Clinical Nursing	<u>3</u>
Total Credits		74

## ASSOCIATE DEGREE REGISTERED NURSING (ADN) Program

Graduates of a state-approved PN program with 2,000 hours of work experience as an LPN are encouraged to make application for the ADN program. The student must also achieve satisfactory test scores on the NLN Nursing Mobility Profile 1, Examination 1 and complete prerequisite science and general education courses. Graduates of the ADN program are eligible to write the State Board examination to be registered nurses.

Practicing LPNs are encouraged to contact the College for information concerning the ADN program prerequisite courses. These courses should be completed prior to acceptance into the ADN program.

ADN programs and courses are offered in Lafayette, Richmond, and South Bend. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

		Credits
Prerequisite Course Areas (Anatomy, Physiology, Microbiology, Chemistry, Psychology)		Regionally Determined
NLN Nursing Mobility Profile I, Examination Book I		Regionally Determined
TECHNICAL COURSES		
4501	Life Cycle Nursing 1: Early Life	8
4502	Life Cycle Nursing Clinical Practicum 1: Early Life	5
4503	Life Cycle Nursing 2: Middle Life	8
4504	Life Cycle Nursing Clinical Practicum 2: Middle Life	5
4505	Life Cycle Nursing 3: Later Life	8
4506	Life Cycle Nursing Clinical Practicum 3: Later Life	5
4507	Issues in Nursing	2
	Regional Electives	9-12
TOTAL CREDITS		90

## RADIOLOGIC TECHNOLOGY

The program, certified by the national accrediting agency, offers courses in anatomy and physiology, medical terminology, and medical law and ethics, and nursing procedures for X-ray technologists. Extensive clinical training with an affiliated hospital is a requirement of the program. Graduates are eligible to take the national certification examination.

A two-year program, requiring 109 credits, leads to the Associate in Applied Science Degree. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs are offered in Indianapolis and Terre Haute.*

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (76 Credits)

Course #	Course Title	Credits
4609	Nursing Procedures for X-ray Technicians	2
4613	Radiation Physics 1	3
4620	Orientation to X-ray Technology	4
4624	Radiographic Positioning 1	3
4625	Radiographic Exposures 1	3
4633	Radiographic Positioning 2	2
4634	Radiographic Exposures 2	3
4642	Imaging Techniques	3
4643	Radiographic Positioning 3	3
4650	Radiographic Positioning 4	3
4655	X-ray Clinical Education 4	6
4661	Special Procedures	3
4668	X-ray Clinical Education 5	6
4672	Radiobiology	3
4678	X-ray Clinical Education 6	6
4685	General Examination Review	4
4688	X-ray Clinical Education 7	6
4699	Radiologic Quality Assurance	3
9349	Anatomy and Physiology	8
9350	Medical Law and Ethics	2

### GENERAL EDUCATION COURSES (5 credits)

Course #	Course Title	Credits
9305	Technical Mathematics for Health Occupations	5

### REGIONALLY DETERMINED ELECTIVES (28 Credits)

Electives (See Course Descriptions)

	28
Total Credits	109

## RESPIRATORY THERAPY TECHNOLOGY

The program trains technicians to treat patients with cardiorespiratory problems. Included are courses in anatomy and physiology, respiratory therapy science, cardiopulmonary physiology, and nursing techniques. Cooperating hospitals and clinics provide clinical experience under the supervision of a physician and respiratory therapist. Graduates of the program may take the national examination for certification as respiratory therapy technicians.

A two-year program, requiring 113 credits, leads to an Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs* and courses are offered in Bloomington, Fort Wayne, Gary, Indianapolis, Lafayette, and Westville. In addition, *selected courses* are available in Angola, Berne, Bluffton, Columbia City, Huntington, and Kendallville.

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (95 Credits)

Course #	Course Title	Credits
4810	Basic Science	4
4812	Respiratory Therapy Science 1	6
4813	Nursing Techniques	3
4820	Cardiopulmonary Physiology	4
4821	Respiratory Therapy Science 2	6
4822	Respiratory Therapy Applications 1	5
4823	Clinical Practicum 1	4
4830	Laboratory Data	3
4831	Clinical Medicine	
4832	Respiratory Therapy Applications 2	5
4833	Clinical Practicum 2	8
4848	Advanced Cardiopulmonary-Renal Physiology	6
4849	Management Techniques for Respiratory Therapy	3
4850	Therapist Clinic 1	7
4851	Therapist Clinic 2	12
4852	Critical Respiratory Care	6
9322	Biophysics for Health Occupations	2
9353	Anatomy and Physiology 1	4
9358	Pharmacology	3

### GENERAL EDUCATION COURSES (18 Credits)

Course #	Course Title	Credits
8110	Technical Communications	4
8203	Technical Mathematics	4
8307	General Chemistry	3
8308	General Microbiology	3
8401	Human Relations	4
Total Credits		113

# **DIVISION OF APPLIED SCIENCE AND TECHNOLOGIES**

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The Division of Applied Science and Technologies provides broad, practical training for those seeking employment and advancement in craft and technical occupations. The programs emphasize the ability to think and plan in the job setting. Initial laboratory experiences develop skills in the use of modern industrial equipment and measuring instruments. Later classroom and laboratory work provide training in industrial applications of theory, analysis, design, and construction techniques. Each program provides opportunities for the student to advance from basic skills to proficiency on a high technological level.

Program advisory committees, composed of experts in each area of industry, serve the important function of keeping the content of the programs current with changes in technology. Ivy Tech's programs and courses are designed to meet the needs of local industries. The practical value of the course work is substantiated by its use in the training programs of many local industries.

## **AGRICULTURAL EQUIPMENT**

The program trains technicians to sell, service, maintain, and repair on- and off-farm agricultural equipment. Technicians are trained in preventative maintenance, including testing, adjusting, cleaning, and tuning engines. Courses are offered in general farm equipment, diesel and gas-powered engines, transmission systems, air conditioning, theory and design, and service and parts-department management. Related courses in math and communications supplement the technical training.

A two-year program, requiring 92 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs* and courses are offered in Indianapolis and Lafayette. In addition, *selected courses* are available in Attica, Crawfordsville, Delphi, Fowler, Frankfort, Gary, Kokomo, Monticello and South Bend.

## **ASSOCIATE IN APPLIED SCIENCE DEGREE program**

### **TECHNICAL COURSES (25 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
5115	Hydraulic Fundamentals	3
5123	Diesel Engines 1	3
5124	Manual Transmissions	3
5125	Open Center Hydraulic Systems	3
5126	Closed Center Hydraulic Systems	3
5127	Hydraulic-Assist Transmissions	3
5132	Diesel Engines 2	3
5133	Environmental Control	4

### **GENERAL EDUCATION COURSES (12 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
8110	Communications	4
8201	Applied Mathematics 1	4
8401	Human Relations	4

### **REGIONALLY DETERMINED ELECTIVES (55 Credits)**

Electives (See Course Descriptions)	<u>55</u>
<b>Total Credits</b>	<b>92</b>

## APPLIED FIRE SCIENCE TECHNOLOGY

The program prepares students for careers in fire technology. Course work includes technical training in fire apparatus, fire fighting strategy and tactics, investigations, and fire prevention. Fire service organization and management courses are available for training in administration. Additional courses in human relations, communications, and psychology prepare graduates for public speaking assignments and other civic responsibilities.

The two-year program, requiring 92 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs and courses are offered in Fort Wayne and Gary. In addition, selected courses are available in Angola, Berne, Bluffton, Chesterton, Columbia City, East Chicago, Evansville, Hammond, Huntington, Kendallville, Kokomo, Michigan City, Munster, Richmond, St. John, and Sellersburg.*

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (54 Credits)

Course #	Course Title	Credits
0913	Techniques of Supervision 1	3
5313	Fire Technology	3
5314	Fire Apparatus 1	3
5323	Fire Apparatus 2	3
5324	Fire Department Hydraulics 1	3
5332	Fire-Fighting Strategy and Tactics 1	3
5333	Fire Alarm and Protection Equipment	3
5334	Fire-Fighting Strategy and Tactics 2	2
5342	Hazardous Materials 1	3
5343	Rescue Practices and Procedures	3
5350	Applied Chemistry	2
5352	Hazardous Materials 2	3
5353	Fire Investigations	4
5360	Fire Service Inspection	4
5362	Fire Department Specifications	4
5363	Fire Prevention	4
5364	Legal Problems in Fire Service	4

### GENERAL EDUCATION COURSES (22 Credits)

Course #	Course Title	Credits
8110	Communications	4
8114	Technical Reporting	3
8203	Technical Mathematics 1	4
8307	General Chemistry	3
8401	Human Relations	4
8402	Applied Behavioral Psychology	4

### REGIONALLY DETERMINED ELECTIVES (16 Credits)

Electives (See Course Descriptions)

	16
Total Credits	92



## COMPUTER-ASSISTED DESIGN - ARCHITECTURAL DRAFTING TECHNOLOGY

The program trains personnel for drafting positions in residential and commercial building industries. The curriculum provides extensive drafting experience and a working knowledge of building materials, mechanical and electrical equipment, estimating, surveying, and rendering. Computer-aided design (CAD) equipment provides valuable experience in the new computer graphics specialty. The program includes laboratory projects and courses in mathematics and communications.

A two-year program, requiring 105 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs* and courses are offered in Columbus, Fort Wayne, Indianapolis, Kokomo, Sellersburg, South Bend, and Terre Haute. In addition, *selected courses* are available in Angola, Berne, Bluffton, Columbia City, Gary, Greenfield, Grissom AFB, Huntington, Kendallville, Lebanon, Linton, Logansport, Muncie, Richmond, and Westfield.

### ASSOCIATE IN APPLIED SCIENCE DEGREE program

#### TECHNICAL COURSES (33 Credits)

Course #	Course Title	Credits
5430	Light Construction Presentation Drafting	3
5431	Light Construction Layout Drafting	3
5433	Light Construction Detail Drafting	3
5440	Medium Construction Presentation Drafting	3
5441	Medium Construction Layout Drafting	3
5442	Medium Construction Detail Drafting	3
5450	Heavy Construction Presentation Drafting	3
5451	Heavy Construction Layout Drafting	3
5453	Heavy Construction Detail Drafting	3
7510	Basic Drafting	3
7511	Intermediate Drafting	3

#### GENERAL EDUCATION COURSES (18 Credits)

Course #	Course Title	Credits
8110	Communications	4
8203	Technical Mathematics 1	4
8208	Geometry	3
8209	Trigonometry	3
8401	Human Relations	4

#### REGIONALLY DETERMINED ELECTIVES (54 Credits)

Electives (See Course Descriptions)	54
Total Credits	105

## SECURITY AND LOSS PREVENTION TECHNOLOGY

The program prepares students for security careers in business, governmental agencies, and nonprofit institutions. Courses examine protective systems and alternatives, the correction system, concepts of criminality, psychological effects of the use of force, and alternatives to the use of firearms. The program also stresses the value of loss prevention in protecting and conserving assets.

A one-quarter program, requiring 16 credits, leads to an Occupational certificate. The student is advised to contact the nearest center for information concerning specific courses or the program of study.

The *program* is offered in Fort Wayne. *Selected courses* are available in Angola, Berne, Bluffton, Columbia City, Gary, Huntington, and Kendallville.

## OCCUPATIONAL CERTIFICATE Program

### TECHNICAL COURSES (16 Credits)

Course #	Course Title	Credits
5501	Security Fundamentals	4
5514	Interviewing	4
5522	Safety and Fire Prevention	4
5530	Loss Prevention	4
Total Credits		16

## AUTOMOTIVE BODY REPAIR TECHNOLOGY

The program prepares students to become qualified body repair technicians. Courses are offered in body, frame, and chassis repair, collision damage, paint refinishing, fiberglass/plastics repair, sheet metal repair, and welding. Training laboratories offer experience on up-to-date, sophisticated equipment, such as the bench measuring and pulling systems used in precision alignment.

A one-year program, requiring 61 credits, leads to the Technical Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs* and courses are offered in Fort Wayne, Gary, Indianapolis, Jeffersonville, Kokomo, Lafayette, Madison, Muncie, and Terre Haute. In addition, *selected courses* are available in Angola, Berne, Bluffton, Columbia City, Evansville, Huntington, Kendallville, and South Bend.

### TECHNICAL CERTIFICATE Program

#### TECHNICAL COURSES (22 Credits)

Course #	Course Title	Credits
5601	Basic Body Repair 1	2
5602	Basic Body Repair 2	2
5603	Basic Body Repair 3	2
5604	Basic Body Repair 4	2
5611	Collision Damage Repair 1	2
5612	Collision Damage Repair 2	2
5620	Frame and Chassis 1	2
5621	Frame and Chassis 2	2
5624	Auto Body Welding 1	2
5625	Auto Paint Shop Practice 1	2
5630	Collision Damage Appraising	2

#### GENERAL EDUCATION COURSES (8 Credits)

Course #	Course Title	Credits
8201	Applied Mathematics 1	4
8401	Human Relations	4

#### REGIONALLY DETERMINED ELECTIVES (31 Credits)

Electives (See Course Descriptions)	31
Total Credits	61



## **AUTOMOTIVE SERVICE TECHNOLOGY**

The program offers courses in chassis and suspension; front-end alignment; braking systems; conventional, electronic, and computerized ignition systems; carburetion and fuel injection systems; tune-up; manual and automatic transmissions; microprocessors; and air conditioning. Training simulators provide practical laboratory experience with computers, electronic ignition systems, and new types of braking systems, front suspensions, and body constructions.

A six quarter program in automotive service technology, requiring 105 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered.

A two-year optional program in automotive service diesel technology, requiring 107 credits, leads to the Associate in Applied Science Degree. The diesel option is offered at Indianapolis.

The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs* and courses are offered in Columbus, Connersville, Evansville, Fort Wayne, Gary, Indianapolis, Jeffersonville, Kokomo, Lafayette, Lawrenceburg, Madison, Muncie, Richmond, Sellersburg, South Bend, Tell City, and Terre Haute. In addition, *selected courses* are also available in Angola, Berne, Bluffton, Boonville, Columbia City, Crane, Crawfordsville, Frankfort, Grissom Air Force Base, Huntington, Kendallville, Linton, Logansport, Mount Vernon, Princeton, Tell City, and Washington.

## **ASSOCIATE IN APPLIED SCIENCE DEGREE Program**

### **TECHNICAL COURSES (57 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
5812	Automotive Chassis and Suspension	3
5813	Automotive Braking Systems	3
5814	Automotive Front End Alignment	3
5821	Engine Theory and Design	3

5822	Engine Tools and Equipment	3
5823	Basic Electricity	3
5825	Fuel and Carburetion - Theory and Circuits	3
5826	Fuel and Carburetion - Overhaul	3
5828	Ignition Systems	3
5832	Starting and Charging Systems - Testing	3
5834	Engine Overhaul	3
5835	Manual Transmission Overhaul	3
5843	Differentials and Rear Axle Overhaul	3
5845	Advanced Tune-Up	3
5847	Air Conditioning - Theory, Service and Components	3
5848	Air Conditioning - Diagnosis and Repair	3
5852	Engine Tune-Up	3
5854	Automatic Transmission - Theory and Operation	3
5862	Comprehensive Diagnosis and Procedures 1	3

#### GENERAL EDUCATION COURSES (19 Credits)

Course #	Course Title	Credits
8110	Communications	4
8201	Applied Mathematics 1	4
8202	Applied Mathematics 2	4
8301	Physical Science	3
8401	Human Relations	4

#### REGIONALLY DETERMINED ELECTIVES (29 Credits)

Electives (See Course Descriptions)	<u>29</u>
Total Credits	105

## BUILDING CONSTRUCTION TECHNOLOGY

The program trains the student to become a skilled technician in one of several specialties within the building construction industry. Included in the program are courses in cabinetry, carpentry, electrical wiring, masonry, plumbing, heating, air conditioning, refrigeration, blueprint reading, and the use of tools and materials. The flexibility of the program allows the student to pursue a full course of study or to take courses only as needed to update skills. Regional program options offer intensive training in selected areas of specialization. The program options are published in the regional catalogs.

A two-year program, requiring 105 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs* and courses are offered in Bloomington, Jeffersonville, Kokomo, Muncie, and Richmond. In addition, *selected courses* are available in Anderson, Evansville, Gary, Grissom AFB, Lebanon, Madison, Marion, and South Bend.

## ASSOCIATE IN APPLIED SCIENCE DEGREE Program

### TECHNICAL COURSES (42 Credits)

Course #	Course Title	Credits
6001	Carpentry Fundamentals	3
6002	Construction Tools and Skills	3
6003	Construction Materials	3
6004	Safety and First Aid	3
6011	Floor and Wall Layout and Construction	3
6012	Roof Construction	3
6013	Blueprint Reading 1	3
6014	Electrical Wiring Fundamentals	3
6015	Residential Wiring 1	3
6023	Blueprint Reading 2	3
6024	Plumbing Fundamentals	3
6036	Masonry and Concrete Fundamentals	3
7112	Heating Fundamentals	3
7123	Air Conditioning and Refrigeration 1	3

### GENERAL EDUCATION COURSES ( 22 Credits)

Course #	Course Title	Credits
0112	Accounting Principles for Non-Majors	4
0122	Business Law 1	3
0323	Business Principles and Organization	3
8110	Communications	4
8201	Applied Mathematics 1	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (41 Credits)

Electives

	41
TOTAL CREDITS	105

## DIESEL POWER TECHNOLOGY

The program provides comprehensive instruction to prepare for entry into the diesel industry field. Included are courses in diesel fuel systems, engine theory, tune-up, rebuild, diagnosis, reassembly and testing, and electrical systems. Students acquire the skills needed to interpret technical manuals and warranties, fulfill specific customer requests, target diesel malfunctions, and keep abreast of current technical developments in the field.

A two-year program, requiring 102 credits, leads to an Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs* and courses are offered in Columbus, Lafayette, New Albany, Sellersburg, and South Bend. In addition, *selected courses* are available in Boonville, Crane, Fort Wayne, Gary, Mount Vernon, Muncie, Plymouth, Princeton, Richmond, Tell City, Terre Haute, and Washington.

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (84 Credits)

Course #	Course Title	Credits
5865	Service Organization and Management	3
6216	Electrical Fundamentals	3
6217	Diesel Electrical Systems Overhaul	3
6218	Diesel Engine Reassembly and Testing	3
6223	Diesel Electrical Systems Testing	3
6227	Diesel Engine Disassembly and Inspection	3
6235	Diesel Engine Theory	3
6236	Fluid Power Fundamentals	4
6240	Diesel Engine Diagnosis	3
6243	Diesel Fuel Systems 1	3
6254	Diesel Engine Upper Rebuild	4
6255	Diesel Engine Lower Rebuild	3
6257	Diesel Component Rebuild	3
6258	Diesel Engine Tune-up	4
6259	Diesel Fuel Systems 2	3
6260	Diesel Fuel Pump Calibration	3
6261	Heavy-Duty Clutches and Manual Transmissions	3
6262	Heavy-Duty Drive Lines and Rear Axles	3
6263	Heavy-Duty Brake Systems	3
6264	Heavy Chassis, Suspension, and Steering	3
6265	Heavy-Duty Automatic Transmissions - Theory and Design	3
6266	In-Vehicle Service of Heavy-Duty Automatic Transmissions	3
6267	Heavy-Duty Automatic Transmissions - Bench Overhaul 1	3
6268	Heavy-Duty Automatic Transmissions - Bench Overhaul 2	3
6269	Advanced Fluid Power	3
6270	Mobile Air Conditioning and Refrigeration - Theory and Service	3
6271	Mobile Air Conditioning and Refrigeration - Diagnosis and Repair	3

### GENERAL EDUCATION COURSES (15 Credits)

Course #	Course Title	Credits
8110	Communications	4
8201	Applied Mathematics 1	4
8301	Physical Science	3
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (3 Credits)

Electives (See Course Descriptions)

	3
Total Credits	102

## ELECTRONICS TECHNOLOGY

(General, Industrial, Communications, Biomedical, Digital Computer, and Instrumentation options)

Six options are available to the student in the Electronics Technology program. The general option prepares for a wide range of technical positions in the electronics field; the specialty options provide training in specific technological areas in electronics. Training laboratories contain up-to-date, sophisticated equipment, including micro-processors and robot trainers. The program prepares the student for the federal and state licensing examinations, as well as for initial employment or upgrading of skills.

A two-year program, requiring 105 credits, leads to an Associate Degree in Applied Science. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs and courses are offered in Anderson, Bloomington, Columbus, Connersville, Crane, Evansville, Fort Wayne, Gary, Hammond, Indianapolis, Jeffersonville, Kokomo, Lafayette, Madison, Muncie, Richmond, Sellersburg, South Bend, and Terre Haute. In addition, selected courses are available in Angola, Berne, Bluffton, Boonville, Columbia City, Connersville, Crawfordsville, Delphi, Elhart/Mishawaka, Huntington, Kendallville, Linton, Marion, Monticello, Mount Vernon, Princeton, Warsaw, and Washington.*

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

The technical and general education courses listed below are included in all the electronics programs, regardless of option. To complete a program, the student must take the common core courses as well as those listed under the option of his or her choice.

### Common Core Curriculum - All Options

#### TECHNICAL COURSES (30 Credits)

Course #	Course Title	Credits
6434	Active Devices	3
6435	Electronics Circuits 1	3
6446	Integrated Circuits	3
6447	Special Semiconductors	3
6470	AC Fundamentals	6
6471	DC Fundamentals	6
6562	Digital Principles 1	3
6563	Digital Principles 2	3

#### GENERAL EDUCATION COURSES (19 Credits)

Course #	Course Title	Credits
8110	Communications	4
8203	Technical Mathematics 1	4
8204	Technical Mathematics 2	4
8209	Trigonometry	3
8401	Human Relations	4



## ELECTRONICS TECHNOLOGY - GENERAL Option

The general option provides broad technological training in electronics for students who do not wish to specialize. Many manufacturing and service industries prefer employees with a more general electronics background. The program prepares students for a wide variety of technical positions, enabling them to change fields more easily as the job market changes.

### TECHNICAL COURSES (57 Credits)

Course #	Course Title	Credits
	(Common Core)	30
6454	Electronics Circuits 2	3
6455	Circuit Analysis	3
6538	Rotating Machines 1	3
6539	Rotating Machines 2	3
6544	Industrial Controls	3
6553	Industrial Electronics 1	3
6554	Industrial Electronics 2	3
6577	Digital Principles 3	3
6578	Digital Applications	3

### GENERAL EDUCATION COURSES (19 Credits)

Course #	Course Title	Credits
	(Common core)	19

### REGIONALLY DETERMINED ELECTIVES (29 Credits)

Electives (See Course Descriptions)	29
Total Credits	105

## ELECTRONICS TECHNOLOGY - INDUSTRIAL Option

The industrial option prepares specialized technicians to troubleshoot electronic equipment used in industry, to perform operations and calculations, and to test and report.

### TECHNICAL COURSES (57 Credits)

Course #	Course Title	Credits
	(Common Core)	30
6454	Electronics Circuits 2	3
6455	Circuit Analysis	3
6538	Rotating Machines 1	3
6539	Rotating Machines 2	3
6544	Industrial Controls	3
6553	Industrial Electronics 1	3
6554	Industrial Electronics 2	3
6577	Digital Principles 3	3
6578	Digital Applications	3

### GENERAL EDUCATION COURSES (19 Credits)

Course #	Course Title	Credits
	(Common Core)	19

### REGIONALLY DETERMINED ELECTIVES (29 Credits)

Electives (See Course Descriptions)	29
Total Credits	105

**ELECTRONICS TECHNOLOGY - COMMUNICATION Option**

The communications option trains the specialized technician to operate, maintain, research, and construct communications equipment, including television, radio, radar, sonar, computer, spacecraft, and control instruments.

**TECHNICAL COURSES (48 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
	(Common Core)	30
6436	AM Radio	3
6438	FM Radio	3
6445	Monochrome Television	3
6448	Color Television	3
6450	Television Troubleshooting	3
6451	Communications Electronics 1	3

**GENERAL EDUCATION COURSES (19 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
	(Common Core)	19

**REGIONALLY DETERMINED ELECTIVES (38 Credits)**

Electives (See Course Descriptions)	38
<b>Total Credits</b>	<b>105</b>

**ELECTRONICS TECHNOLOGY - BIOMEDICAL Option**

The biomedical option trains specialized technicians to test, calibrate, and repair the complex biomedical equipment used in hospitals.

**TECHNICAL COURSES (82 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
	(Common Core)	30
6424	Troubleshooting Techniques	3
6436	AM Radio	3
6438	FM Radio	3
6454	Electronics Circuits 2	3
6455	Circuit Analysis	3
6525	Test Equipment	3
6540	Medical Electronics 1	3
6541	Medical Electronics 2	3
6542	Medical Electronics 3	3
6553	Industrial Electronics 1	3
6577	Digital Principles 3	3
6578	Digital Applications	3
6583	Electrical Safety for Hospitals	4
9353	Anatomy and Physiology 1	4
9354	Anatomy and Physiology 2	4
9355	Medical Terminology	4

**GENERAL EDUCATION COURSES (22 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
	(Common Core)	19
8114	Technical Reporting	3

**REGIONALLY DETERMINED ELECTIVES (1 credit)**

Electives (See Course Descriptions)	1
<b>Total Credits</b>	<b>105</b>

**ELECTRONICS TECHNOLOGY - DIGITAL COMPUTER Option**

The digital computer option prepares specialized technicians to diagnose equipment problems, to repair and install equipment, and to interpret manuals, flow charts, and other materials related to data processors and digital computers.

**TECHNICAL COURSES (57 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
	(Common Core)	30
6455	Circuit Analysis	3
6520	Microprocessors 1	3
6527	Peripherals 1	3
6533	Microprocessors 2	3
6535	Peripherals 2	3
6536	Programming	3
6547	Linear Integrated Circuits Applications	3
6577	Digital Principles 3	3
6578	Digital Applications	3

**GENERAL EDUCATION COURSES (19 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
	(Common Core)	19

**REGIONALLY DETERMINED ELECTIVES (29 Credits)**

Electives (See Course Descriptions)	29
<b>Total Credits</b>	<b>105</b>

**ELECTRONICS TECHNOLOGY - INSTRUMENTATION Option**

The instrumentation option trains the specialized technician to assist in the installation, maintenance, repair, and calibration of process control instruments and to troubleshoot simple process control systems.

**TECHNICAL COURSES (48 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
	(Common Core)	30
6550	Electromechanical Controls	3
7346	Industrial Instrumentation 1	3
7347	Industrial Instrumentation 2	3
7390	Instrumentation Calibrations	3
7391	Measurements and Calibrations	3
7392	Flow Measurements and Calibrations	3

**GENERAL EDUCATION COURSES (19 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
	(Common Core)	19

**REGIONALLY DETERMINED ELECTIVES (38 Credits)**

Electives (See Course Descriptions)	38
<b>Total Credits</b>	<b>105</b>

## BARBERING TECHNOLOGY

This program is designed to train individuals and provide them with the background and expertise to establish themselves in a barbering/hairstyling career.

Courses contain basic history and ethics of the profession, basic haircutting, shampooing, bacteriology, sterilization and sanitation. Additional courses include the art of shaving, perming, coloring, processing, and additional work with hairstyling. Shop management, advanced haircutting and a combined techniques course complete the coursework.

This six quarter program, requiring 102 credits, leads to a Technical Certificate and qualifies a student to take the state-administered licensing test.

This program is offered at the United States Penitentiary at Terre Haute.

## TECHNICAL CERTIFICATE Program

### TECHNICAL COURSES (71 Credits)

Course #	Course Title	Credits
6709	Shaving Shop Application	1
6710	History and Professional Ethics of Barbering	2
6711	Bacteriology, Sterilization and Sanitation	3
6712	Barbering Implements	2
6713	Shaving	3
6714	Basic Haircutting	5
6715	Shampooing and Rinsing	3
6717	Basic Haircutting Shop Application	5
6718	Shampooing and Rinsing Shop Application	1
6719	Mustaches and Beards Shop Application	2
6720	Mustaches and Beards	4
6721	Scalp and Hair Treatments	3
6722	Theory of Massage	2
6723	Facial Treatments	4
6724	Anatomy and Physiology	4
6726	Scalp and Hair Treatments Shop Application	3
6727	Facial Treatment Shop Application	2
6730	Basic Chemistry	4
6731	Electricity and Light Therapy	2
6732	Skin, Scalp and Hair	3
6733	Advanced Haircutting	5
6734	Waving Techniques	5
6736	Advanced Haircutting Applications	3
6737	Waving Techniques Shop Application	3
6738	Permanent Waving Shop Application	2
6739	Chemical Hair Processing and Hair Coloring Applications	1
6740	Chemical Hair Processing	4
6741	Permanent Waving	5
6742	Shop Management	4
6743	Hair Styling	5
6745	Combined Techniques Shop Application	3
6746	Hair Styling Shop Application	4

GENERAL EDUCATION COURSES (None)

REGIONALLY DETERMINED ELECTIVES (None)

TOTAL CREDITS 102

## **AUTOMATED MANUFACTURING TECHNOLOGY (Pending Approval)**

The program prepares technicians to design, install, calibrate, program, operate, test, analyze, troubleshoot, service, and repair advanced manufacturing, assembly, and materials-handling systems and data computer networks. A multi-disciplinary technological program which utilizes mechanical, electrical, thermal, fluids, and/or technologies to (1) shape, form and process raw materials into finished products, (2) assemble parts into finished products using sensing, vision, and robotic techniques, (3) automated modern material handling techniques including conveyors, manless parts vehicles and storage systems, and (4) computer data communications networks such as machine controllers, robot controllers, cell computers and computers adapted for inventory control and manufacturing. Coursework includes microprocessor fundamentals, digital principles, computer programming, sensor and system interfacing, robotics, hydraulics and pneumatics, CAD/CAM fundamentals, automated manufacturing fundamentals and technical mathematics.

A two-year program, requiring 105 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Program* is pending approval in South Bend, Fort Wayne, Lafayette, Muncie, Indianapolis, Richmond and Columbus.

## **ASSOCIATE IN APPLIED SCIENCE DEGREE program**

### **TECHNICAL COURSES (71 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
6434	Active Devices	3
6447	Special Semiconductors	3
6470	AC Fundamentals	6
6471	DC Fundamentals	6
6520	Microprocessors 1	3
6562	Digital Principles 1	3
6901	Manufacturing Processes	3
6903	Sensor and System Interfacing	3
6905	Robotics Principles 1	3
6907	Robotics Principles 2	3
6909	CAD/CAM Fundamentals	3
6911	Work Cell Design	3
6913	Automated Manufacturing Systems 1	3
6915	Automated Manufacturing Systems 2	3
6919	Manufacturing System Control	3
6921	Failure Analysis Techniques	3
6923	Applied Mechanisms	3
7341	Hydraulic and Pneumatic Principles	3
7342	Hydraulic and Pneumatic Systems and Repair	3
9472	Computer Programming for Technicians	3

### **GENERAL EDUCATION COURSES (28 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
8110	Communications	4
8114	Technical Report Writing	3
8203	Technical Mathematics 1	4
8204	Technical Mathematics 2	4
8209	Trigonometry	3
8302	Physics 1	3
8303	Physics 2	3
8401	Human Relations	4

### **REGIONALLY DETERMINED ELECTIVES (12 Credits)**

Electives

Total Credits	<u>12</u> 105
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## HEATING/AIR CONDITIONING/REFRIGERATION TECHNOLOGY

The program provides training in heating and cooling service, blueprint reading, electrical circuits and controls, duct fabrication and installation, heat loss and gain calculation, service organization and management, and equipment sales.

Technicians in this field service and install residential, commercial, and industrial equipment, they also hold various sales and sales-support positions. Students may choose to specialize in installation or in service (maintenance and repair). Some technicians concentrate on certain equipment, such as gas furnaces or commercial refrigerators; others service and install all types of equipment.

A two-year program, requiring 105 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs* and courses are offered in Bloomington, Columbus, Evansville, Fort Wayne, Gary, Indianapolis, Jeffersonville, Kokomo, Lafayette, Muncie, Richmond, Sellersburg, South Bend, Terre Haute, and Valparaiso. In addition, *selected courses* are available in Anderson, Angola, Berne, Bluffton, Boonville, Columbia City, Crane, Grisom Air Force Base, Hammond, Huntington, Kendallville, Linton, Logansport, Marion, Mount Vernon, Princeton, Tell City, Warsaw, and Washington.

### ASSOCIATE IN APPLIED SCIENCE DEGREE program

#### TECHNICAL COURSES (67 Credits)

Course #	Course Title	Credits
7112	Heating Fundamentals	3
7113	Basic Electricity	3
7114	Basic Mechanics and Shop Techniques	3
7123	Air Conditioning and Refrigeration 1	3
7124	Heating Service (Gas and Oil)	3
7125	Motors and Motor Control	3
7126	Air Conditioning and Refrigeration 2	3
7127	Heating Service (Electrical and Hydronic)	3
7133	Cooling Service - Electrical	3
7134	Cooling Service - Mechanical	3
7135	Electrical Circuits and Controls	3
7136	Psychrometrics	3
7137	Heat Loss and Gain Calculation	3
7143	Blueprint Reading	3
7144	Commercial Refrigeration	3
7145	Heat Pump Service	3
7153	Advanced Commercial Refrigeration	3
7154	Duct Fabrication and Installation	3
7155	Specifications and Estimating	3
7163	Air Distribution System Design	3
7165	Advanced Electrical/Electronic Controls 1	3
7176	Applied Design	4

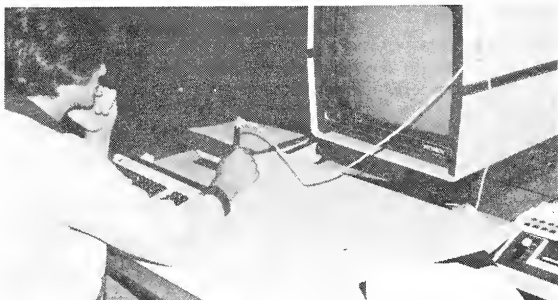
#### GENERAL EDUCATION COURSES (16 Credits)

Course #	Course Title	Credits
8110	Communications	4
8201	Applied Mathematics 1	4
8202	Applied Mathematics 2	4
8401	Human Relations	4

#### REGIONALLY DETERMINED ELECTIVES (22 Credits)

Electives (See Course Descriptions)

	<u>22</u>
Total Credits	105



### COMPUTER-ASSISTED DESIGN - INDUSTRIAL DRAFTING TECHNOLOGY

The program provides training for industrial employment and for upgrading the skills of those already employed. The program offers study of industrial processes and systems and training in several drafting areas, including tool, die, product design, gear and cam design, machine design, and jig and fixture design. Courses in computer-aided design, (CAD) using sophisticated, up-to-date equipment, offer practical experience in the new computer graphics specialty.

A two-year program, requiring 105 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs and courses are offered in Bloomington, Columbus, Evansville, Fort Wayne, Gary, Indianapolis, Jeffersonville, Kokomo, Muncie, Sellersburg, South Bend, and Valparaiso. In addition, selected courses are available in Angola, Berne, Bluffton, Boonville, Columbia City, Crane, Crawfordsville, Elhart/Mishawaka, Fowler, Greenfield, Huntington, Kendallville, Lafayette, Lebanon, Linton, Logansport, Monticello, Mount Vernon, Princeton, Richmond, Terre Haute, Washington, and Westfield.*

### ASSOCIATE IN APPLIED SCIENCE DEGREE program

#### TECHNICAL COURSES (27 Credits)

Course #	Course Title	Credits
7510	Basic Drafting	3
7511	Intermediate Drafting	3
7521	Industrial Processes and Systems	3
7522	Production Drawing	3
7530	Product Drafting 1	3
7532	Tool Drafting	3
7533	Die Design	3
7540	Product Design Drafting	3
7552	Strength of Materials	3

#### GENERAL EDUCATION COURSES (18 Credits)

Course #	Course Title	Credits
8110	Communications	4
8203	Technical Mathematics 1	4
8208	Geometry	3
8209	Trigonometry	3
8401	Human Relations	4

#### REGIONALLY DETERMINED ELECTIVES (60 Credits)

Electives (See Course Descriptions)

	60
Total Credits	105

## INDUSTRIAL MAINTENANCE TECHNOLOGY

The program trains technicians to maintain industrial facilities and equipment. Industrial maintenance personnel work in various capacities for manufacturing firms, factories, contractors, building management firms, hotels, motels, apartment complexes, and other service-oriented industries. Three program options offer training in specialized areas within the industrial maintenance field.

The FACILITY option focuses on the maintenance and repair of buildings and sites. Studies include carpentry, electrical wiring, plumbing, heating and air conditioning, and welding as it pertains to facility repair.

The MACHINERY option concentrates on the maintenance and repair of industrial equipment, with emphasis on pneumatic, mechanical, and hydraulic systems. Studies include machine tooling, hydraulics, drafting, and welding pertaining to equipment repair and maintenance.

The ELECTRICAL option specializes in the maintenance and repair of electrical and electronic equipment and systems used in industry. Studies focus on electrical circuitry, instrumentation, test equipment, rotating machines, and digital equipment.

A two-year program, requiring 105 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs and courses are offered in Evansville, Fort Wayne, Gary, Indianapolis, Jeffersonville, Lafayette, Logansport, Muncie, Richmond, South Bend, Tell City, Terre Haute, and Valparaiso. In addition, selected courses are available in Anderson, Angola, Attica, Berne, Bluffton, Boonville, Columbia City, Columbus, Crane, Crawfordsville, Delphi, Fowler, Frankfort, Huntington, Kendallville, Kokomo, Madison, Marion, Monticello, Mount Vernon, Princeton, Tell City, and Washington.*

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

The technical and general education courses listed below are included in all the industrial maintenance programs, regardless of option. To complete a program, the student must take the common core courses as well as those listed under the selected option.

### Common Core Curriculum - All Options

#### TECHNICAL COURSES (24 Credits)

Course #	Course Title	Credits
0930	General Industry OSHA and First Aid	3
6410	Basic AC/DC Circuits	4
7341	Hydraulic and Pneumatic Principles	3
7352	Troubleshooting Skills	3
7310	General Print Reading	4
7375	Utilities Distribution Systems	4
8066	Introductory Welding (Non-Majors)	3

#### GENERAL COURSES (18 Credits)

Course #	Course Title	Credits
8110	Communications	4
8203	Technical Mathematics 1	4
8208	Geometry	3
8301	Physical Science	3
8401	Human Relations	4



**INDUSTRIAL MAINTENANCE - FACILITIES Option****TECHNICAL COURSES (48 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
	(Common Core)	24
6001	Carpentry Fundamentals	3
6014	Electrical Wiring Fundamentals	3
6024	Plumbing Fundamentals	3
7112	Heating Fundamentals	3
7123	Air Conditioning and Refrigeration 1	3
7127	Heating Service - Electric and Hydronic	3
7133	Cooling Service - Electrical	3
7134	Cooling Service - Mechanical	3

**GENERAL EDUCATION COURSES (18 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
	(Common Core)	18

**REGIONALLY DETERMINED ELECTIVES (39 Credits)**

Electives (See Course Descriptions)	<u>39</u>
<b>TOTAL CREDITS</b>	<b>105</b>

**INDUSTRIAL MAINTENANCE - MACHINERY Option****TECHNICAL COURSES (49 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
	(Common Core)	24
7340	Machine Diagnosis and Repair - Mechanical	3
7342	Hydraulic and Pneumatic Systems and Repair	3
7343	Preventive Maintenance	3
7348	Millwright 1	4
7349	Millwright Shop 1	3
7710	Machine Tool Introduction	3
7711	Machining Fundamentals 1	3
7734	Advanced Print Reading	3

**GENERAL EDUCATION COURSES (18 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
	(Common Core)	18

**REGIONALLY DETERMINED ELECTIVES (38 Credits)**

Electives (See Course Descriptions)	<u>38</u>
<b>TOTAL CREDITS</b>	<b>105</b>

**INDUSTRIAL MAINTENANCE - ELECTRICAL Option****TECHNICAL COURSES (48 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
	(Common Core)	24
6424	Troubleshooting Techniques	3
6525	Test Equipment	3
6538	Rotating Machines 1	3
7331	Industrial Machine Electrical Circuits	3
7339	Machine Diagnosis and Repair - Electrical	3
7346	Industrial Instrumentation 1	3
7371	Industrial Digital Principles	3
7372	Industrial Digital Applications	3

**GENERAL EDUCATION COURSES (18 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
	(Common Core)	18

**REGIONALLY DETERMINED ELECTIVES (39 Credits)**

Electives (See Course Descriptions)	<u>39</u>
<b>TOTAL CREDITS</b>	<b>105</b>

## MINING OPERATIONS TECHNOLOGY

The program offers on-the-job training as well as classroom study in coal operation and management. Courses include mining law, blasting and explosives, mine machinery, operations, reclamation mine planning, and economics of mining.

The program prepares students for mining jobs ranging from apprentice to experienced machine operator. Entry positions vary with the type and method of mining.

The two-year program, requiring 116 credits, leads to an Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

The *program* is offered in Terre Haute. *Selected courses* are available in Muncie.

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (88 Credits)

Course #	Course Title	Credits
7341	Hydraulic and Pneumatic Principles	3
7342	Hydraulic and Pneumatic Systems and Repair	3
7610	Mining Fundamentals	5
7611	General Physical Geology	5
7612	Surface Mining Machinery	4
7621	Mine Maps and Surveying	3
7622	Mine Maps and Surveying Laboratory	2
7623	Elements of Reclamation	4
7631	Elements of Spoil Management	4
7632	Equipment Operations Laboratory 1	4
7633	Welding Principles	4
7640	Blasting and Explosives	5
7641	Operation Safety and Accident Prevention	4
7642	Electrical Circuits and Systems	4
7643	Economics of Mining and Cost Calculations	4
7650	Coal Preparation Plants	2
7651	Coal Sampling and Analysis	3
7652	Labor Relations	3
7653	Transmission Systems	4
7654	Mine Operation Planning	4
7660	First Aid and Safety Management	4
7662	Coal Mine Supervision	5
7663	Water Drainage and Water Pollution Laws	5

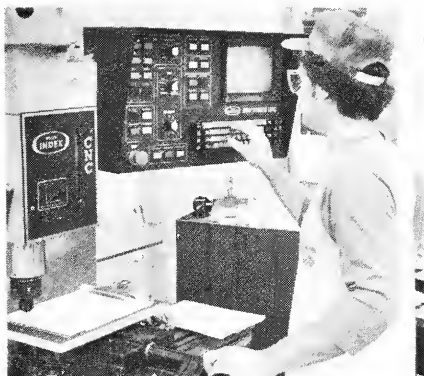
### GENERAL EDUCATION COURSES (25 Credits)

Course #	Course Title	Credits
8110	Communications	4
8113	Oral Communications	4
8203	Technical Mathematics 1	4
8208	Geometry	3
8209	Trigonometry	3
8222	Trigonometry 2	3
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (3 Credits)

Electives (See Course Descriptions)

	3
Total Credits	116



## MACHINE TOOL TECHNOLOGY

The program provides training in many facets of the machine tool industry through work with machines and machine tools, including tool/cutter grinders, computer-controlled machines, and precision inspection equipment. Courses include machine tool fundamentals, theory, and applications; machine processing, setup, and operation; print reading; die making; heat treating; grinding; milling and drilling operations, and precision measurement. New training equipment, including computerized numerical-controlled lathes, provide up-to-date instruction.

Machine tool technicians maintain, set up, and operate tools at peak efficiency. Technicians also plan and test machines and tools for performance, durability, and efficiency and occasionally make recommendations for design changes to improve performance. Testing procedures include recording data, making computations, plotting graphs, analyzing results, and writing reports.

Most machine tool technicians work in factories or small tool and die shops that produce machined metal products, transportation equipment, and machinery. Others work in production or maintenance departments or tool rooms.

The two-year program, requiring 105 credits, leads to an Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs and courses are offered in Connersville, Fort Wayne, Gary, Hammond, Indianapolis, Lafayette, Logansport, Muncie, Richmond, and South Bend. In addition, selected courses are available in Angola, Attica, Berne, Bluffton, Boonville, Columbia City, Columbus, Connersville, Crane, Huntington, Kendallville, Kokomo, Madison, Mount Vernon, Princeton, Tell City, Terre Haute, Warsaw, and Washington.*

**ASSOCIATE IN APPLIED SCIENCE DEGREE program****TECHNICAL COURSES (36 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
6909	CADD/CAM Fundamentals	3
7710	Basic Machine Tool Introduction	3
7711	Machining Fundamentals 1	3
7712	Machining Fundamentals 2	3
7720	Machine Tool Processing	3
7721	Machine Tool Setup and Operation	3
7730	Advanced Machine Tool Processing	3
7731	Basic Print Reading	3
7733	Advanced Machine Tool Setup and Operation	3
7740	Specialized Machining Theory	3
7742	Specialized Machine Tool Application 1	3
7758	Numerical Control and Automatic Processing 1	3

**GENERAL EDUCATION COURSES (18 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
8110	Communications	4
8203	Technical Mathematics 1	4
8208	Geometry	3
8209	Trigonometry	3
8401	Human Relations	4

**REGIONALLY DETERMINED ELECTIVES (51 Credits)**

Electives (See Course Descriptions)

	<u>51</u>
<b>Total Credits</b>	<b>105</b>

## PLASTICS MANUFACTURING TECHNOLOGY

The program prepares skilled technicians for the plastics field. Training is offered in plastic materials, testing, and fabrication. Attention is given to various types of plastics; thermosetting and thermoplastic compounds; operation, setup, and maintenance of plastics machines; uses of plastics in production processes; injection and extrusion molding; product, mold, and tool design; quality control; print reading; electrical circuits; hydraulics; and pneumatics.

The program offers students the opportunity to develop skills in molding and/or die making while acquiring training in plastics technology. In this way, students in the plastics field may also acquire a foundation in machine technology.

A two-year program, requiring 90 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

The *program* is available in South Bend.

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (33 Credits)

Course #	Course Title	Credits
0913	Techniques of Supervision 1	3
7331	Industrial Machine Electrical Circuits	3
7341	Hydraulic and Pneumatic Principles	3
7731	Basic Print Reading	3
7801	Introduction to Plastics	3
7802	Plastic Extrusion	3
7803	Plastic Injection Molding	3
7804	Plastic Materials	3
7805	Low-Pressure Tooling	3
7806	Thermoplastic Processes - General	3
7807	Plastics Quality Control	3

### GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8113	Oral Communications	4
8201	Applied Mathematics 1	4
8202	Applied Mathematics 2	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (37 Credits)

Electives (See Course Descriptions)

Total Credits	<u>37</u> 90
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## POLLUTION TREATMENT TECHNOLOGY

The program prepares students for occupations in wastewater treatment and air pollution control as used by industries, municipalities, and institutions. Specialized training is provided in two program options: WASTEWATER MANAGEMENT and ENVIRONMENTAL CONTROL. Because of the diversity of Indiana's waste-treatment facilities, courses, workshops, and seminars in specific areas, including wastewater and water supply treatment, air pollution control, solid waste and toxic substance management, water distribution, and the control of hazardous materials, are offered on a regional basis. Course work also covers equipment and maintenance, reporting and purchasing, community sanitation, environmental administration, and plant operations. The program prepares the student for initial employment, the state licensing examinations, and the upgrading of skills.

The two-year program, requiring 96 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs* and courses are offered in Gary, Indianapolis, and Westville. In addition, *selected courses* are available in Columbus, Evansville, Grissom Air Force Base, Hammond, Kokomo, Lafayette, Logansport, Madison, Richmond, South Bend, Terre Haute, and Valparaiso.

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

The technical and general education courses listed below are included as a part of both pollution treatment programs, regardless of option. To complete a program, the student must take the common core courses as well as those listed under the selected option.

### Common Core Curriculum - Both Options

#### TECHNICAL COURSES (34 Credits)

Course #	Course Title	Credits
7913	Environmental Control	4
7915	Applied Chemistry 1	3
7934	Basic Hydraulics	4
7951	Reporting and Purchasing	2
7954	Plant Operations 1 - Municipal	4
7955	Management and Supervision Procedures	3
7961	Plant Operations 2 - Municipal	3
7963	Plant Operations 3 - Industrial	3
7964	Plant Mathematics	4
7972	Environmental Administration	4

#### GENERAL EDUCATION COURSES (28 Credits)

Course #	Course Title	Credits
8110	Communications	4
8113	Oral Communications	4
8114	Technical Reporting	3
8203	Technical Mathematics 1	4
8204	Technical Mathematics 2	4

8301	Physical Science	3
8307	General Chemistry	3
8308	General Microbiology	3

### **POLLUTION CONTROL - WASTEWATER MANAGEMENT Option**

#### TECHNICAL COURSES (54 Credits)

Course #	Course Title	Credits
	(Common Core)	34
7113	Basic Electricity	3
7125	Motor and Motor Control	3
7348	Millwright 1	4
7349	Millwright Shop 1	3
7350	Millwright 2	4
7351	Millwright Shop 2	3

#### GENERAL EDUCATION (28 Credits)

Course #	Course Title	Credits
	(Common Core)	28

#### REGIONALLY DETERMINED ELECTIVES (14 Credits)

Electives (See Course Descriptions)	<u>14</u>
<b>TOTAL CREDITS</b>	<b>96</b>

### **POLLUTION CONTROL - ENVIRONMENTAL CONTROL Option**

#### TECHNICAL COURSES (48 Credits)

Course #	Course Title	Credits
	(Common Core)	34
7916	Environmental Seminar	1
7943	Water Supply and Treatment	4
7957	Community Sanitation	3
7960	Air Pollution Control 1	4
7966	Hazardous Materials	2

#### GENERAL EDUCATION COURSES (28 Credits)

Course #	Course Title	Credits
	(Common Core)	28

#### REGIONALLY DETERMINED ELECTIVES (14 Credits)

Electives (See Course Descriptions)	<u>14</u>
<b>TOTAL CREDITS</b>	<b>96</b>





## WELDING TECHNOLOGY

The program offers training in several types of welding processes: MIG, TIG, pipe-welding, oxy-acetylene gas welding and cutting, and shielded metal arc welding. Course work includes interpretation of welding blueprints, electrical fundamentals for welding, metallurgy, and OSHA requirements.

A two-year program, requiring 105 credits, leads to the Associate in Applied Science Degree. A one-year Technical Certificate, requiring 66 credits, is also offered. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

*Programs* and courses are offered in Anderson, Evansville, Fort Wayne, Gary, Hammond, Indianapolis, Jeffersonville, Kokomo, Lafayette, Madison, Muncie, Richmond, Sellersburg, South Bend, Tell City, Terre Haute, and Valparaiso. In addition, *selected courses* are available in Angola, Berne, Bluffton, Boonville, Columbia City, Crane, Crawfordsville, Delphi, Fowler, Frankfort, Grissom AFB, Huntington, Kendallville, Linton, Monticello, Mount Vernon, Princeton, Tell City, Warsaw, and Washington.

## ASSOCIATE IN APPLIED SCIENCE DEGREE program

### TECHNICAL COURSES (53 Credits)

Course #	Course Title	Credits
8013	Blueprint Interpretation	3
8024	Welding Blueprint Interpretation	3
8040	Welding Equipment Maintenance	3
8055	Special Welding Processes	4
8061	Pipe Welding 1	5
8063	Electrical Fundamentals for Welding	3
8064	Basic Metallurgy	3
8090	Shielded Metal Arc Welding 1	5
8095	Shielded Metal Arc Welding 2	5
8096	Gas Metal Arc (MIG) Welding	5

8097	Gas Tungsten Arc (TIG) Welding	5
8098	Welding Certification	4
8099	Oxyacetylene Welding and Cutting	5

GENERAL EDUCATION COURSES (16 Credits)

Course #	Course Title	Credits
8110	Communications	4
8201	Applied Mathematics 1	4
8202	Applied Mathematics 2	4
8401	Human Relations	4

REGIONALLY DETERMINED ELECTIVES (36 Credits)

Electives		36
	Total Credits	105

## SKILLS DEVELOPMENT COURSES

Skills development or learning skills courses are offered at each regional learning resource center. They emphasize the basics of mathematics, communications, reading, and science combined with supplementary material oriented toward the specific occupations. All skills development instruction is designed to enable the students to be successful in courses necessary for them to meet their educational objective. Instruction includes classroom and self-paced courses. Listed below are skills development courses offered.

8151	Developmental Writing 1 (Pre-Tech)	3-4
8152	Developmental Reading 1 (Pre-Tech)	2-4
8153	Developmental Reading 2 (Pre-Tech)	2-4
8154	Developmental Reading 3 (Pre-Tech)	2-4
8155	Intrapersonal Skills Development (Pre-Tech)	4
8156	Study Skills Development (Pre-Tech)	2
8157	Communications Skills Development (Pre-Tech)	3
8159	Improving Your Handwriting (Pre-Tech)	2
8160	Developmental Writing 2 (Pre-Tech)	4
8162	Spelling (Pre-Tech)	2
8163	Learning Development (Pre-Tech)	4
8167	Language Skills Development (Pre-Tech)	4
8168	Language Skills (Pre-Tech)	4
8170	Developmental Speech (Pre-Tech)	4
8251	Arithmetic 1 (Pre-Tech)	2
8252	Arithmetic 2 (Pre-Tech)	2
8253	Arithmetic 3 (Pre-Tech)	2
8254	Intermediate Arithmetic 1 (Pre-Tech)	2
8255	Intermediate Arithmetic 2 (Pre-Tech)	2
8256	Intermediate Arithmetic 3 (Pre-Tech)	2
8257	Elementary Algebra (Pre-Tech)	3
8258	Elementary Geometry (Pre-Tech)	2
8259	Elementary Trigonometry (Pre-Tech)	2
8261	Occupational Mathematics 1 (Pre-Tech)	2
8262	Occupational Mathematics 2 (Pre-Tech)	2
8263	Developmental Mathematics 1 (Pre-Tech)	2
8264	Developmental Mathematics 2 (Pre-Tech)	2
8265	Mathematics Concepts (Pre-Tech)	3
8266	Mathematical Skills (Pre-Tech)	4
8267	Mathematics for Business 1 (Pre-Tech)	4
8268	Mathematics for Business 2 (Pre-Tech)	4
8272	Mathematics Skills Development (Pre-Tech)	4
8273	Basic Mathematics Review (Pre-Tech)	3
8274	Ratio, Proportion, and Measurement (Pre-Tech)	3
8275	College Algebra	4
8350	Science Development in Physics (Pre-Tech)	1
8351	Science Development in Chemistry (Pre-Tech)	1
8352	Science Development in Biology (Pre-Tech)	1
8353	GED Science 1	3
8451	Orientation to the World of Work (Pre-Tech)	2

# COURSE DESCRIPTIONS

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## Business, Office and Information Systems Technologies

### **0110 Accounting Principles 1** **4**

Introduces fundamental principles, techniques, and tools of accounting. Instructs in the mechanics of accounting, including collection, summary, analysis, and reporting of information pertaining to service and mercantile enterprises.

### **0112 Accounting for Non-Majors** **4**

Analyzes financial statements to determine levels of company efficiency and performance. Instructs in ratio and trend analysis, budgeting, capital expenditures, and price-level effects on accounting

### **0120 Accounting Principles 2** **4**

Studies payroll, automated accounting systems, internal control, notes and interest, departmental accounting, sales procedures, and valuation of receivables, inventories, and fixed assets.

### **0122 Business Law 1** **3**

Studies the judicial system and the nature and sources of business law. Describes the nature of torts and crimes for which the law provides punishment. Emphasis is placed on legal situations encountered in the performance or breach of contracts, in the creation of an agency, and in sales and negotiable instruments.

### **0123 Business Law - Professional Secretarial Examination** **4**

Introduces the study of business law to candidates preparing for the Professional Secretarial Examination. Covers contracts and the operation of governmental controls of business, real and personal property, legal instruments, court procedures, sales, and product liability and related statutes.

### **0124 Consumer Economics** **3**

Includes study and review of cost of living and price levels, factors affecting consumer choices and buying practices, management of personal and family finances, the role of government in consumer protection, and current consumer problems.

<b>0130 Accounting Principles 3</b>	<b>4</b>
Develops accounting skills in journal and statement presentation of corporated capital stock, receivables, intangible assets, deferred charges, long-term liabilities, and temporary and long-term investments. Introduces branch operations accounting.	
<b>0136 Accounting for Government and Nonprofit Entities</b>	<b>3</b>
Introduces principles of fund accounting (governmental and nonprofit), accounting for and compliance with budgets, types of funds, and categories and groups of accounts.	
<b>0138 Computer-Augmented Accounting</b>	<b>4</b>
Introduces mainframe, mini or microcomputer processing of financial data for business. Focuses on how computers receive, handle, store, retrieve, and print large amounts of data.	
<b>0140 Intermediate Accounting 1</b>	<b>4</b>
Studies accounting principles pertaining to the income statement and balance sheet, cash receipts, disbursements and reconciliations, accounts receivable, and bad debts.	
<b>0141 Individual Income Taxes</b>	<b>4</b>
Presents accounting procedures and problems associated with state and federal income tax laws pertaining to individuals, estates, and trusts.	
<b>0142 Job Order Cost Accounting</b>	<b>4</b>
Studies job order cost accounting procedures, manufacturing overhead control, departmentalization, material and labor control, and report forms.	
<b>0143 Business Law 2</b>	<b>3</b>
Includes study of bailments, secured transactions, partnerships and corporations, property, wills and trusts, insurance, suretyship, guaranty, and bankruptcy.	
<b>0150 Intermediate Accounting 2</b>	<b>4</b>
Provides intermediate and advanced study of accounting principles pertaining to corporations, temporary investments, long-term investments, special bond transactions, amortization, revaluation and retirement of plant and equipment, repairs and maintenance, depreciation, natural resources, intangible assets, and inventory valuation.	
<b>0151 Process Cost Accounting</b>	<b>4</b>
Studies process cost accounting, standard cost procedures, and estimation and control of costs by means of budget use and profit analysis.	
<b>0152 Business Income Tax</b>	<b>4</b>
Studies accounting procedures and problems pertaining to federal income tax law, state laws for corporations, and partnerships.	

**0153 Microeconomics 3**

Examines the economics of supply and demand with regard to the individual consumer and producer. Studies factors determining price, output, allocation of scarce resources, distribution, and income.

**0154 Macroeconomics 3**

Provides analysis of national income accounting through study of the GNP and components. Attention is given also to the operation of the monetary and banking system and international economic problems.

**0155 Managerial Accounting 3**

Studies the relationship of accounting records to managerial decision-making. Covers internal accounting records, the role of data processing, and quantitative business analysis.

**0156 Accounting Laboratory 1-6**

Offers exercises in solving accounting problems, using concepts and theories learned in previous accounting technology courses.

**0157 Payroll Accounting 4**

Studies payroll accounting practices associated with small and medium-sized firms and larger corporations.

**0160 Intermediate Accounting 3 4**

Covers accounting practices pertaining to stockholders' equity, corporate earnings, corporate dividends, statement of change in financial position, and financial statement analysis.

**0162 Auditing 3**

Studies public accounting organization and operation, including internal control, internal auditing, verification of the balance sheet and operating accounts, and the auditor's report of opinion.

**0164 Money and Banking 3**

Studies monetary and banking theories as they relate to present-day domestic and international problems. Topics include banking operations, price changes, international monetary relationships, and application of monetary and fiscal policy.

**0165 Budgeting 3**

Presents procedures for the preparation and use of business budgets. Emphasis is placed on budgeting as an important aid in coordinating and directing business operations.

**0166 Management 3**

Studies the vital role of management in organizations of various sizes. Examines the interrelationships of various departmental functions and establishes the lines of

authority and responsibility. Also studies the manager's duties with regard to communications, motivation, and delegation of authority

### **0167 Seminar in Accounting 1**

Provides an opportunity to pursue areas of special interest in accounting at a more advanced level.

### **0169 Personal Finance 3**

Emphasizes management of individual financial resources for growth and maintenance of personal wealth. Covers home buying and mortgage financing, installment financing, life insurance, securities, commodities, and other investment opportunities.

### **0171 Finance 1 3**

Studies business finance as influenced by capital structure and types of ownership. Gives attention also to sources and methods of financing.

### **0172 Finance 2 3**

Examines tools of financial analysis and management, problems relating to sources of financing, and economic theory as applied to business finance.

### **0173 Consumer Credit 3**

Studies economic and social aspects of credit and the institutions supplying consumer credit. Organizes the consumer credit cycle into basic areas of acquisition, control, and collection. Examines the credit cycle in relation to various consumer credit grantors.

### **0174 Credit Procedures 3**

Examines principles and methods of credit administration in the mercantile and retail fields. Covers sources of information, credit policy, credit control, legal remedies, and collection techniques.

### **0175 Credit Management 1 3**

Studies the functions of management in acquiring and controlling a cycle of credit and explores the occupational opportunities in the credit field. Includes lectures, discussions, and individual research and projects with written and oral presentations of findings.

### **0176 Credit Management 2 3**

Studies management of credit operations, management functions pertaining to collection cycle, and credit law. Includes lectures, discussions, and individual research and projects with written and oral presentation of findings.

### **0177 Commercial Credit 3**

Presents theory, principles, and practices of credit and collection management as they pertain to the needs of businesses. Deals with all phases of commercial, consumer, and mortgage credit, with emphasis on commercial and short- and intermediate-term credit. Attention is given to managerial functions relating to credit acquisition and control and to collection policies, procedures, and methods.

**0178 Credit and Collections 3**

Approaches the study of retail credit organizations, operations, and investigations, from both retail and mercantile standpoints. Includes study of retail terms and policies, the opening of credit accounts, mercantile credit operations, credit information, methods of collection of past due accounts, and analysis of financial statements.

**0179 Review course: Accounting Practitioner's Exam - Theory 4**

Prepares candidates for the Indiana State Board of Accountancy Accounting Practitioners' Examination. The examination is based upon the theory and practice sections of the Uniform Certified Public Accountants Examination.

**0180 Review Course: Accounting Practitioner's Exam - Practice 4**

Prepares advanced students for the Indiana State Board of Accountancy Accounting Practitioners' Examination.

**0320 Management Principles 3-4**

Describes the functions of managers, including the management of activities and personnel. Focus is placed on application of guidance principles in management work.

**0321 Office Administration 4**

Covers broad areas of administrative office services and management, including office organization, site location, layout and environment, records management, system controls, and office communication services and devices.

**0322 Personnel Administration 4**

Focuses on the activities of the personnel administrator, with emphasis on employer-employee relations, job analysis and evaluation, salary administration, work measurement and standards, and performance appraisal.

**0323 Business Principles and Organization 3**

Examines our business system in relation to our economic society. Studies business ownership, organization principles and problems, management, control facilities, administration, and development practices of American business enterprises.

**0328 Laws Applied to Business 3-4**

Examines laws pertaining to business, with focus on contracts, the Uniform Commercial Code, and forms of business organization.

**0329 Investment 3**

Presents the basics of investing, with attention to the ways in which various investment vehicles operate.

**0330 Transportation Law 1 3**

Prepares students for the A.S.T. & T. certification program. Covers judicial systems and regulatory agencies, regulatory acts, Motor Carrier Act-1980, Staggers Rail Act-1980, obligations, rights and liabilities, regulation of rates, and rate-making agreements.



**0331 Transportation Law 2****3**

Prepares students for the A.S.T. & T. certification program. Covers carrier finance, mergers and acquisitions, discrimination and rebates, practices and procedures, I.C.C. general rules of practice, canon of ethics, and appeal and judicial review.

**0412 Vocabulary Building****3**

Offers intensive study of spelling and vocabulary. Includes rules of spelling, effective use of the dictionary, and techniques for building the vocabulary.

**0432 Speed Building 1****1**

Develops speed and accuracy in straight copy typing, with minimum exit speed at 45 net words per minute.

**0441 Speed Building 2****1**

Develops speed and accuracy from straight copy typing, with minimum exit speed for course set at 50 net words per minute.

**0452 Speed Building 3****1**

Develops speed and accuracy in straight copy typing, with minimum exit speed at 55 net words per minute.

**0453 Medical Terminology****4**

Studies terms pertaining to medical ethics and professional conduct, including the use, spelling, and meanings of Greek and Latin prefixes, suffixes, roots and combining forms. Also instructs in the use of a medical dictionary.

**0510 Data Processing Fundamentals****5**

Introduces electronic data processing and programming, with emphasis on processing. Includes the development of data processing from manual methods through electromechanical to electronic, the role of data processing in business organizations, data processing applications, computer hardware, internal data representation, stored program concepts, programming systems, elementary programming, operations research, and data processing as a profession.

**0511 Programming****5**

Introduces computer programming, including basic concepts, procedures and language.

**0512 BASIC Programming****5**

Introduces BASIC, a computational, problem-oriented language. Covers use of arithmetical expressions, conditional control, iteration techniques, input-output specifications, tables, and sub-programs for solving problems involving computation.

**0514 Pascal Programming Language****5**

Presents the Pascal programming language, emphasizing Pascal features that make modular programming easy. Attention given to the terminology used in writing programs that can be string-tested.

## **0520 COBOL Programming Fundamentals** **5**

Provides a working knowledge of the COBOL programming language and its applications to business data processing. Develops proficiency in solving basic business problems with COBOL language.

## **0521 Practical Computer Operations** **5**

Demonstrates computer operations, emphasizing proficiency in handling and setting up complex disc and tape file runs. Includes running book and message control functions and reading job descriptions and flow charts.

## **0522 Problem-Solving Fundamentals** **3**

Demonstrates efficient problem solving techniques for computer programming logic problems. Develops ability and confidence through examples and exercises.

## **0530 Advanced COBOL Programming** **5**

Emphasizes complex file-handling techniques and use of advanced COBOL extensions. Develops a higher level of COBOL proficiency and a working knowledge of advanced features and techniques through laboratory experience.

## **0531 Operating Systems** **5**

Studies computer operating systems, purposes, structure, and functions. Studies how comprehensive sets of language translators and service programs, operating under supervisory coordination of an integrated control program, form the total operating system of a computer.

## **0532 Job Control Language** **4**

Studies in depth the basic and intermediate levels of control language oriented toward multiprogramming versions of OS, MFT and MVT. Focus is placed on positional parameters, keyword parameters, operands, general formats, coding rules, and practical applications of the job control language used in OS installations.

## **0533 Microcomputers** **2**

Introduces the BASIC programming language for members of the small business community. Covers BASIC programming concepts for micro- and minicomputers, the components of a computer system, common input/output devices, and software for business systems.

## **0534 Electronic Data Processing** **7**

Introduces mathematics useful in solving or simplifying computer programs, including numbering system, logic, and algorithms. Includes the role of data processing in an organization, computer applications, computer hardware, internal data representation, stored program concepts, and programming as a profession.

## **0540 Systems Analysis and Design** **4**

Studies functions and techniques of systems analysis, design, and development. Includes scientific analysis, systems flow charting, data collection techniques, file design and management, and processing and equipment requirements. Stresses

reporting methods and communications between the user and the data processing department. Includes analysis of case studies for problems and solutions.

#### **0541 COBOL Programming 3**

5

Offers advanced study in COBOL programming, including programming with direct access devices and using the COBOL sort feature. Covers structured programming and documentation. Continues study of job control language.

#### **0551 Business Programming Applications**

5

Offers advanced study in business programming as applied to distribution, manufacturing, banking, and insurance corporations. Covers billing, accounts receivable, sales analysis, payroll, inventory, and costs computed by both manual and computer methods. Includes exercises in programming.

#### **0560 Data Communications**

4

Demonstrates data communications techniques as applied to data processing. Includes vocabulary and techniques common to remote processing, time sharing, and data transmission.

#### **0567 Microcomputer Database Management**

4

Presents microcomputer database management, using dBASE-II and a personal computer. Included are a brief introduction to the personal computer, interactive dBASE-II, and programming using the dBASE-II Application Development Language (ADL).

#### **0568 BASIC Language Programming**

4

Course designed for those with no previous background in computers or programming. Includes terminology, common input/output devices, computer software, flowcharting, rules of the BASIC language, arithmetic and string operations, input and output operations, program control statements, programming, debugging, and testing techniques.

#### **0569 Assembly Language for Microcomputers**

4

An introduction to Assembly language programming using microcomputers. Covers internal data representation, addressing modes, and the instruction set. Also includes the concepts of input/output operation, comparing, and arithmetic operations used in typical application programs.

#### **0570 Assembly Language Fundamentals for Mainframe Computers**

5

Introduces machine-oriented, low-level programming language (choice of language taught depends on the type of machine access) and its commercial applications. Laboratory exercises include coding, debugging, and testing of assembler language programs.

#### **0571 Survey of Business Data Processing**

3

Surveys the scope and significance of data processing for businesses. Familiarizes the student with basic computer concepts and electronic data processing equip-

ment. Course aimed toward the non-data processing major. Allows for some hands-on introductory training.

**0573 RPG II Programming Fundamentals 5**

Demonstrates the use of compiler language RPG II in solving business problems. Attention is given to multiple input and/or output and the use of business mathematics.

**0574 PL/I Programming 1 5**

Introduces the PL/I programming language, and its capabilities, limitations, and uses in solving programming problems. Laboratory exercises include coding, debugging, and testing of PL/I programs.

**0575 Topics in Data Processing 1 5**

Discusses topics of current interest in data processing. Attention is given to special interest projects for students in data processing.

**0576 Advanced Assembly Language for Mainframe Computers 5**

Emphasizes disk and tape programming techniques.

**0577 Topics in Data Processing 2 5**

Offers further discussion of topics of current interest in data processing. Attention is given to special interest projects for advanced students in data processing.

**0579 Advanced RPG II Programming 5**

Offers advanced study in the use of compiler language RPG II in solving business problems. Attention is given to multiple input and/or output and the use of business mathematics.



#### **0580 Structured COBOL for Programmers**

5

Presents the theory of structured design and structured programming techniques. Emphasizes, through laboratory exercises, how these concepts contribute to the development of more efficient computer programs. Topics include hierarchical organization, module level design, top-down and bottom-up design, structured walkthrough, and "ego-less" programming.

#### **0582 Advanced BASIC Language Programming**

4

Emphasis is placed on complex file-handling techniques and use of advanced extensions. Laboratory exercises are designed to develop proficiency and a working knowledge of advanced features and techniques in BASIC programming.

#### **0583 Database Design**

4

Introduces program applications in a database environment, with emphasis on loading, modifying, and querying the database by means of a host language (COBOL). Discusses data structures; indexed and direct file organizations; models of data, including hierarchical, network, and relational; storage devices; data administration and analysis; design; and implementation.

#### **0585 Distributed Data Processing**

4

Examines centralized, decentralized, and distributed systems and the impact of distributed systems on business enterprise. Discusses the technological developments in computer hardware, software, and communications as they relate to the design, development, and implementation of distributed data processing systems.

#### **0590 C.I.C.S. Command Level Programming**

4

Studies the organization, operation, and use of C.I.C.S., the principles of data communication, and the incorporation of those principles in C.I.C.S. Students will write pseudo-conversational C.I.C.S. programs to illustrate such features as terminal control, file control, reentry, task mapping, temporary storage, and program control.

**0711 Hospitality Management 4**

Traces the growth and development of the lodging industry from early practices to modern high-rise commercial hotels and highway motels, with special attention given to future trends and opportunities. Studies the nature and organization of the business, including sales promotion, guest relations, guest room facilities, space utilization, food and beverage facilities, accounting records, financial management, and administrative control.

**0712 Front Office Procedures 4**

Introduces front office principles, problems, and procedures related to modern lodging operations. Covers public relations, front office responsibilities, salesmanship, cashier's charges, and posting machines.

**0718 Housekeeping Techniques 2**

Explains and demonstrates the basic tools required in institutional housekeeping. Gives instruction in accepted cleaning techniques.

**0722 Apartment Management and Leasing 3**

Examines the responsibilities of landlords and tenants in apartments, townhouses, condominiums, and other permanent rental properties. Includes study of small and large complexes, business and maintenance details, and roles of personnel in each setting.

**0723 Convention Management 3**

Examines cooperative relationships between successful hotel and motel properties. Emphasizes methods of convention sales.

**0724 Financial Management and Control 4**

Studies special applications of accounting principles to the hospitality industry. Includes business principles pertaining to food and lodging; methods of recordkeeping for creditors, owners, and government; and payroll control. Special emphasis is given to tax laws specific to the industry, expense control, and techniques of profitable management.

**0725 Institutional Management 3**

Studies management problems unique to institutions, including boarding schools, professional sports training camps, summer camps, hospitals, nursing homes, prisons, and facilities for retirement, mental health, and extended care. Develops awareness of basic common needs throughout the hospitality industry. Guest lectures and field trips to institutions highlight the study.

**0726 Property Management 3**

Covers all phases of property management. Studies first impression, staffing, training, capital investments, cost analysis, rentals, and renovation.

**0727 Tourism 3**

Provides comprehensive study of tourism principles, practices, and philosophies. Offers practical education in the business of tourism.

- 0728 Hotel-Motel Seminar** **3**  
Offers opportunities by means of guest lectures and group discussion to explore particular problems or topics of current interest.
- 0729 Restaurant Operations** **4**  
Provides an overview of restaurant operations and actual experience in a specialty restaurant setting.
- 0731 Basic Cooking Methods 1** **4**  
Explains and demonstrates the fourteen basic forms of food preparation.
- 0732 Fish and Seafood Preparation** **4**  
Explains and demonstrates methods of preparation for hot and cold fish, crustaceans, shellfish, and mollusks. Includes baking, poaching, braising, sauteing, deep fat frying, broiling, grilling, and gratinating methods.
- 0733 Food and Beverage Management and Service** **4**  
Presents principles and practices of food production and service management, sanitation, menu planning, cost and labor control, and the purchasing, storage, and merchandising of food and beverages. Discusses problems pertaining to labor shortages, convenience foods, and changes in consumer tastes.
- 0737 Meat Preparation** **4**  
Explains and demonstrates basic methods of preparation for beef, veal, pork, lamb, poultry and game. Includes sauteing, broiling, grilling, stewing, simmering, poaching, boiling, and braising methods.
- 0738 Meat 1** **4**  
Focuses on meat identification as established by the National Association of Meat Purveyors. Demonstrates the cutting of carcasses into primal cuts and the breakdown of beef, lamb and pork.
- 0739 National Dishes** **3**  
Teaches the student how to apply basic cooking methods and forms of preparation to national dishes. Features the preparation of Swiss, French, German, English and American, Italian, Austrian, and other fine cuisine.
- 0742 Food and Beverage Purchasing and Control** **4**  
Studies the major food groups purchased by quantity buyers. Includes fresh and processed fruits and vegetables, dairy products, cereals and cereal products, beverages, poultry and eggs, fish and shellfish, meats, and alcoholic beverages. Outlines the essentials of effective food and beverage control and establishes systems for determining sale values.
- 0743 Basic Cooking Methods 2** **4**  
Demonstrates the preparation of bases, stocks, sauces, and soups.

**0744 Sanitation****4**

Studies in detail the principles and practices of sanitation for food service operations. Includes general cleaning practices, environmental sanitation, and the scientific principles underlying good sanitation practices. Attention is given also to personal hygiene and the importance of sanitation from both economic and legal points of view.

**0747 Buffet Catering****4**

Progresses to advanced instruction in cold food preparation and presentation techniques. Demonstrates charcuterie, specialty canapes, hors d'oeuvres, appetizers, pates, galantines, chaud-froids, terrines, tallow and ice carving, aspics, mousses, cold sauces, vegetable carving, and food decoration. Covers food materials' utilization, buffet planning, layout, equipment, zoning, and services. Provides a practical approach to decorating platters for industrial and classical buffets. Students plan, prepare, present and serve a cold buffet.

**0749 Advanced Baking: Blown and Pulled Sugar****4**

Presents fundamental techniques of sugar work used in the creation of decorative and unique table settings.

**0751 Food and Beverage Cost Control, Planning, and Procedures****4**

Studies the various areas of control in a food and beverage operation. Covers the points of control, people planning, and procedures for stabilizing and monitoring controls.

**0752 Sales Promotion****4**

Demonstrates the development of a marketing plan for any size operation. Shows how to unite all departments of a hotel operation into a coordinated team. Emphasizes the organization and functioning of the sales department, with attention to sales tools and techniques, advertising, and types of markets.

**0760 Hotel-Motel Maintenance 1****3**

Examines the organization of a maintenance and engineering department. Discusses plumbing, heating, ventilation, refrigeration, air conditioning, and electrical systems, vertical transportation, structural maintenance, painting, landscaping, contracts, communication, acoustics, fire protection, and maintenance of kitchen equipment.

**0762 Hotel-Motel Supervisory Housekeeping****4**

Introduces the fundamentals of housekeeping management. Emphasis is placed on employee training, record-keeping, health and safety, cost control, and executive housekeeper responsibilities.

**0763 Hotel-Motel Maintenance 2****3**

Offers advanced study in hotel-motel maintenance and engineering. Emphasis is placed on maintenance procedures and the establishment of preventive maintenance programs.

**0801 Statistical Process Control****3**

Provides machine operators with the skills necessary for scientific monitoring and



control of processes. Emphasizes principles and techniques of statistical process control required to complete a job correctly in one organizational effort. Topics include sampling inspections, process control, and use of charts to measure significance of variation.

### **0803 Advanced Statistical Process Control 3**

Focuses on the use of attributes and variable charts, trend analysis for achieving minimum variability, and assessment of machine and process capability. Emphasis is placed on the application of control charts. Develops skills through student projects in a simulated work environment.

### **0805 Statistical Process Control Application 3**

Collects and analyzes attribute and variable data from assembly line and finished products.

### **0807 Process Control Gauging and Measurement 3**

Studies computerized statistical process control, using statistical software and data analyzers. Covers the use of microprocessor based gauges in automated record keeping. Attention is given to selection of the proper gauge for specific applications. Offers practical experience in the use of typical gauge inputs to the computer, such as digital gauges, optical comparator, ultrasonic thickness gauges, laser measurement devices, and hardness gauges.

### **0809 Employee Participation Techniques and Quality Improvement 3**

Studies the development of an employee involvement program which is occasionally referred to as "circle", "team", "group" and other concepts. Topics covered include a variety of problem-solving techniques such as brainstorming, cause and effect diagrams, data gathering, check sheets, pareto analysis, central location, frequency distribution, and histograms. Covers the role of management and employees in the process and relationship to participative management.

### **0901 Quality Control Concepts and Techniques 1 4**

Studies current quality control concepts and techniques in industry, with emphasis on modern manufacturing requirements.

### **0902 Quality Control Concepts and Techniques 2 4**

Emphasizes recent technological developments.

### **0903 Quality Control Engineering Principles and Techniques 4**

Presents principles and techniques of modern quality control engineering, with attention to management, engineering, economic, and production factors. Emphasis is placed on the assurance of quality at the hardware, processing, and systems levels.

### **0904 Statistical Concepts and Techniques 4**

Presents various topics pertaining to statistical applications of quality control, including frequency distribution, probability theory and applications, and sampling techniques.

**0905 Quality Control Engineering Theory and Application****4**

Presents current theory and applications of quality engineering for assurance and verification of product quality at the hardware, processing, and systems levels. Emphasis is placed on statistical analysis, laboratory experiments, and test and case problem solving applications.

**0907 Reliability Objectives****4**

Introduces the development and principles of reliability engineering. Establishes the mathematical and physical bases of reliability and applies the basic elements of reliability data analysis. Surveys concepts basic to modern reliability requirements, with emphasis on practical applications in manufacturing processes and production operations.

**0908 Nondestructive Tests****4**

Presents an overview of the relationship of nondestructive testing to the total quality function. Attention is given to the advantages and limitations of various test methods.

**0909 Mechanical Metrology****4**

Provides instruction and laboratory experiments in the use of mechanical testing and measurement equipment for quality control.

**0912 Manufacturing Organization 1****3**

Studies the organization of a typical manufacturing operation, with attention to the functional components of the organization and their interrelationships. Reviews organizational principles as they apply to the operation, and examines the duties and responsibilities of the first-line supervisor. Develops the basic tools of managerial decision-making and applies them to typical case problems.

**0913 Techniques of Supervision 1****3**

Studies employee development, with emphasis upon the responsibilities of the beginning or newly appointed supervisor. Gives attention to functioning within the organizational structure, communications, motivation, delegation of authority, interviews, orientation and induction of new employees, and evaluation of employee performance.

**0915 Electrical Metrology****4**

Offers instruction and laboratory experiments in the use of electrical testing and measurement equipment for quality control.

**0916 Procurement Quality Control****4**

Studies principles and functions of procurement quality control. Covers inspection techniques, tools, and records.

**0917 Reliability Techniques****4**

Studies reliability techniques and applications designed to obtain or improve reliability analysis.

**0921 Industrial Safety 3**

Provides training in accident prevention, with emphasis on safety practices, fire prevention, first aid, accident investigation, and rules of plant protection.

**0923 Techniques of Supervision 2 3**

Develops the necessary skills for effective supervision of personnel. Includes group discussion of selected topics, case studies, and in-basket situations.

**0925 Manufacturing Organization 2 3**

Studies quality control, research and development, marketing, production, inventory control, personnel, and maintenance functions. Attention is given also to forms of ownership, analysis of financial data, capital investment, and budgeting.

**0926 Floor Care 3**

Provides instruction in the various types of flooring and the procedures for floor care. Course is designed for students in custodial maintenance.

**0928 Restroom Care 3**

Instructs in cleaning service procedures for restrooms, as part of janitorial service work.

**0930 General Industry OSHA and First Aid 3**

Studies the Occupational Safety and Health Act (OSHA) and standards. Alerts the student to industrial hazards, and demonstrates first aid techniques as outlined in the American Red Cross multimedia course.

**0931 Time and Motion Study 3**

Demonstrates industrial applications of time and motion studies in establishing rates.

**0932 Safety Regulations 3**

Studies the preparation and maintenance of accident records, severity rates, workmen's compensation and insurance claims, and the management of safety programs to comply with laws or contractual agreements.

**0939 Statistical Process Control 3**

Provides supervisors and machine operators with the necessary skills for scientific monitoring and control of processes. Emphasizes principles and techniques of statistical process control needed to complete a job correctly in one organizational effort. Topics include vendor-customer relationships, sampling inspections, process control, and use of various charts to measure significance of variation.

**0940 Quality Control 3**

Studies the function of quality control in fulfilling organizational objectives. Includes principles and techniques of quality control, vendor-customer relationships, sampling inspections, process control, and tests for significance. Attention is given to the type of quality control best suited to the needs of particular industries.

- 0941 Labor Relations** **3**  
Examines labor laws and practices pertaining to industrial relations. Covers development and application of laws, mediation, conciliation, collective bargaining, arbitration, and handling of grievances.
- 0942 Purchasing and Inventory Control** **4**  
Studies purchasing procedures and inventory management.
- 0950 Manufacturing Costs and Value Analysis** **3**  
Studies testing procedures used to measure value and reduce costs in design, development, and manufacturing without loss of quality. Differs from cost control in that the focus is on value rather than cost.
- 0951 Production Planning and Control** **3**  
Studies production planning concepts and inventory control techniques and applications.
- 0952 Work Analysis and Improvement** **3**  
Demonstrates the value of work analysis and methods for work improvement, with emphasis on the responsibilities of managers and supervisors. Introduces the tools of scientific analysis, methods of work simplification, and techniques of implementing improvements. Leads to the development of an effective work philosophy and ability to effect positive change on the job.
- 0954 Materials Handling** **3**  
Studies applied stresses and quality controls pertaining to the handling and storing of industrial materials. Attention is given to shelf life of materials, weight and mass configuration, and specifications of vendors' materials.
- 0956 Managerial Cost Accounting** **3**  
Studies standard cost systems, budgets, and use of budgets as control devices. Emphasis is on methods of presenting and interpreting cost data for use in managerial decision-making.
- 0960 Economics of Industry** **3**  
Discusses fundamentals of economics and principles of business systems in everyday language, with emphasis on the practical rather than the theoretical. Topics include types of business organizations, costs and pricing, competition, money system, taxes, productivity, and automation.
- 0961 Plant Layout and Process Planning** **3**  
Studies principles and practices of factory planning, including layout fundamentals, layouts for small and medium-sized plants, and selection of equipment for the production and handling of materials. Attention is given to tooling determination and operational time, setup, and sequence. Emphasizes efficiency in the arrangement of work areas for reduction of costs.

- 0962 Traffic and Transportation Management 1** **3**  
 Studies transportation systems, federal regulations, freight classification, rates, tariffs, and claims.
- 0963 Manufacturing Processes 1** **3**  
 Offers study in the technical aspects of manufacturing processes, with attention to the industrial materials and machine tools used in modern processing.
- 0964 Industrial Assembly Techniques** **3**  
 Studies methods of assembly, fasteners, assembly materials, metallurgy, plastics, and modern composition.
- 0967 Drafting and Manufacturing Standards** **3**  
 Presents drafting theory and practice, with special attention to standard practices of dimensioning, tolerancing, and notations of tooling components. Covers revolving out of position, line elimination, and sectioning.
- 0968 Case Problems in Management** **4**  
 Requires the student to apply both quantitative and qualitative skills to case study problems in management. Solutions demand planning, leadership, and financial analysis.
- 0970 Personnel Management** **3**  
 Study includes manpower planning, employee recruitment, selection and placement, promotions, transfers, separations, and wage and salary administration.
- 0971 Manufacturing Processes 2** **3**  
 Studies design, specifications, facilities, and economics of manufacturing processes and materials. Includes visits to several manufacturing concerns.
- 0972 Traffic and Transportation Management 2** **3**  
 Offers further studies in transportation systems, federal regulations, freight classification, rates, tariffs, and claims.
- 0973 Training for Results** **3**  
 Studies employee training as an organizational resource. Demonstrates how to develop and implement effective training programs. Attention is given to the nature of learning, concept teaching, the creation of a motivating learning atmosphere, use of audiovisual aids, planned versus spontaneous learning, rote teaching, mnemonic devices, learning curves, and learning as problem solving.
- 0974 Conference Leadership** **3**  
 Outlines the personal qualities and skills needed in conference leadership. Assists participants in developing their roles as organizers, facilitators, controllers, summarizers, speakers, and problem definers and solvers. Demonstrates how to utilize and develop effectively the resources of others.

- 0975 Management Information Systems 3**  
Presents concepts and applications of business management information systems, with emphasis on the role of information systems persons and equipment. Attention is given to the systems approach to problem identification and solution, system analysis and design, information and the management process, and other management systems. Includes class discussion of organizational examples.
- 0976 Organization Structure and Change 3**  
Provides managers and supervisors at all levels with a better understanding of the concepts of change. Presents techniques for implementing planned change to enhance an organization without destroying its structure. Emphasizes and develops the practical skills necessary to cope with both planned and unplanned change.
- 0977 Industrial Supervision Seminar 3**  
Provides opportunities to explore various leadership styles and their effects on others in a low-risk atmosphere. Aids the student in developing alternative patterns of leadership.
- 0980 Case Problems in Labor Relations 3**  
Studies labor relations problems and methods of arbitration. Students study briefs from both sides of actual arbitration cases and render decisions for discussion in class. The students' decisions are then compared with those made by the actual arbitrators.
- 0981 Transactional Analysis for Managers 3**  
Examines concepts of transactional analysis (TA) as applied to interpersonal communication and human motivation in the industrial workplace. Explores concepts and develops the skills necessary to use the language, tools and techniques of TA on the job.
- 0982 Management by Objectives 3**  
Investigates practical uses, values, and problems of an MBO system. Participants will develop company, departmental, and individual objectives and determine how to implement them effectively.
- 0983 Time Management 2-3**  
Trains supervisors and other personnel in more effective management of the business day. Attention is given to time management strategies and behavior patterns. Coursework provides exercises in scheduling and allocating time, identifying and handling time wasters, dealing with interruptions, and planning for better use of the working day.
- 1112 Introduction to Business 4**  
Provides a broad overview of business operations, including management, marketing, production, finance, accounting, data processing, legal structures, economics, and the role of government in business.

- 1114 Marketing 1** **4**  
 Introduces the field of marketing and the basic concepts of marketing goods and services. Attention is given to marketing mix.
- 1115 Sales Techniques** **4**  
 Provides an overview of selling and selling skills, including the work of the sales salesperson. Studies the psychology of selling and develops selling skills through a series of selling situations.
- 1116 Marketing 2** **4**  
 Applies the business and marketing concepts and principles studied in Marketing 1 (1114) to case studies.
- 1117 Practical Retailing Operations** **4**  
 Examines retailing structures, functions, practices, and procedures. Includes employee responsibilities, written and oral communications, math review, customer relations, and sales transactions. Develops skills for entry level position in retailing.
- 1126 Principles of Wholesaling** **4**  
 Studies wholesaling within the marketing distribution structure, including the design and management of the channels of distribution. Attention is given to the wholesale market and wholesaling middleman, relationships with manufacturers and retailers, and activities incident to the sale of products for resale or business use.
- 1134 Sales Management** **4**  
 Focuses on the role of the sales manager, with emphasis on the leadership function. Demonstrates personal selling as the major promotional method used in the American economic system. Covers the building of a sales team, judging sales performance, territorial management, techniques of sales recruiting and interviewing, training and development, and management of the field sales office. Includes sales support and liaison, property, liability, and operations.
- 1135 Retailing** **4**  
 Studies retailing concepts and practices, including retail merchandise planning, buying, pricing, promotion, and control in established retail operations. Attention is given to managerial and operational skills.
- 1136 Physical Distribution** **4**  
 Studies the physical flow of products and the operation of efficient flow systems, with emphasis on the economics of transportation. Examines rates, traffic service, and coordination problems of transportation systems.
- 1137 Buying and Inventory Control** **4**  
 Focuses on decision-making and the skills required in the purchasing of products and services for business. Attention is given to procurement, negotiation, transportation, and inventory management.

**1140 Real Estate Sales****4**

Offers an introductory course in real estate, taught in accordance with the guidelines established by the Indiana Real Estate Commission. Topics include property description, marketing real estate, licensing, financing, contracts, zoning, closing procedures, and property management.

**1141 Appraising the Single Family Residence****3**

Presents fundamentals and techniques of real property valuation. Focuses on theory and application of the three basic techniques of real estate appraisal.

**1147 Advertising****4**

Focuses on advertising as the key element in the promotion of goods and services in the marketplace. Attention is given to the advertising media and media selection, advertising copy strategies, advertising regulations, and the organization of advertising functions.

**1148 Insurance****4**

Examines risks faced by business firms and considers ways of handling them. Covers property, liability, and personal losses, with attention to insurance contracts and their uses. Studies individual life, health, and pension insurance, public policy, government regulations, and social insurance programs.

**1149 Condominium and Cooperative Association Management****4**

Presents the fundamentals of community association management, with special attention to condominium management. Study includes a survey of the definitions of condominium, the Indiana Horizontal Land Act, types of management, insurance, governing documents, and governing bodies and committees.

**1150 On-Site Resident Management****4**

Offers a comprehensive course for the on-site (resident) manager. Presents practical information and time-tested methods to enable resident managers to make sound management decisions. Includes established procedures for the implementation of those decisions.

**1151 Public Relations****4**

Introduces the public relations field, including the role of public relations in business, industry, and nonprofit organizations, the benefits of public relations, the tools of the public relations practitioner, and principles and trends of the field.

**1156 Advanced Sales Techniques****3**

Demonstrates successful selling techniques, including probing, supporting, overcoming objections, and closing. Attention is given to techniques for counseling and training others to improve their selling skills.

**1157 Entrepreneurship****4**

Explores small business operations for the self-employed or the generalist administrator employed in a small business enterprise. Includes entry into small business,



form and structure of the business, financing and tax considerations, business hazards, government regulations, and doing business with the government.

### **1161 Business Management 4**

Develops managerial and business skills for the entrepreneur or manager of small- to medium-size firms. Emphasizes a practical approach to management, personnel relations, marketing functions and strategies, financial management and control, and legal requirements. Course is intended for beginning business students, non-business majors, and non-degree students.

### **1210 Shorthand 1 4**

Introduces symbol shorthand, including theory, brief form, and speed in reading from plate or machine notes. Introduces dictation, with emphasis on writing shorthand outlines or mastering the machine keyboard.

### **1211 ABC Shorthand 4**

Offers an alternative shorthand, using letters of the alphabet rather than shorthand symbols.

### **1212 Typewriting 1 4**

Studies touch typewriting techniques and their applications. Includes typing of business letters and manuscripts, centering, tabulation, machine parts and care, and speed development.

### **1213 Switchboard Operation 1**

Introduces use of the telephone switchboard and operation of the PBX800. Covers message systems, visitor hospitality, and the role of the receptionist.

### **1214 Personal Development 3**

Analyzes and improves posture and develops weight control. Attention is given to personal hygiene, grooming, wardrobe, personality, communication skills, resume-writing, and interviewing skills.

### **1215 Filing 3**

Demonstrates procedures for maintaining and retrieving business records of various types. Includes indexing, coding, sorting, cross-referencing, filing, and follow-up procedures.

### **1220 Shorthand 2 4**

Develops dictation, note-reading, and transcription skills through drills and tests. Emphasizes speed, accuracy, and use of correct English.

### **1222 Typewriting 2 4**

Focuses on business letters, forms, manuscripts, and tabulations. Builds speed and accuracy, with emphasis on production typing.

- 1224 Records Management** 3
- Introduces methods and procedures of maintaining business records of various types, with attention to filing systems and file; maintenance. Develops skills through practice situations.
- 1226 Data Entry** 4
- Develops a high level of skill in keyboarding operation of modern data-entry equipment. Emphasizes speed and accuracy.
- 1230 Shorthand 3** 4
- reviews fundamental shorthand skills, emphasizing new matter dictation and mailable transcription. Emphasizes use of correct English.
- 1232 Typewriting 3** 4
- Improves production typing skills. Includes complex tabulation, statistical reports, rough drafts, manuscripts, and forms.
- 1233 Key Device Training** 4
- Develops a high level of skill in operating keypunch, or key-to-tape, or key-to-disc equipment. Stresses speed and accuracy.
- 1236 Office Calculating Machines** 3
- Develops competency in the operation of adding and calculating machines as used in business offices.
- 1237 Office Calculating Machines 2** 4
- Instructs in the use of newly developed machines. Includes case studies.
- 1238 Advanced Key Device Training 1** 4
- Leads to a higher development of vocational competency. Includes key verifying, programming for different types of card, disk, and/or tape data recorders. Stresses speed and accuracy, with emphasis on production keying problems.
- 1239 Advanced Key Device Training 2** 4
- Enables the advanced student to gain further proficiency with production projects on key device equipment. Offers experience on a wide variety of key device equipment.
- 1240 Shorthand 4** 4
- Offers further study in shorthand skills, with emphasis on correct English usage.
- 1241 Clerical Office Procedures** 3
- Explores the range of opportunities available in the clerical field. Includes filing, machine transcription, and duplicating machine techniques and receptionist training. Also introduces the duties of legal, medical, and administrative secretaries.

- 1242 Typewriting 4**  
Develops a high level of typing skills. Emphasizes complex tabulation, statistical reports, rough drafts, manuscripts, and forms.
- 1243 Office Management and Procedures 3**  
Studies human relations, personnel department functions, and employment procedures, with emphasis on management skills and business office techniques. Offers opportunities to apply knowledge and skills in office management situations.
- 1245 Business English for Word Processing 4**  
Studies basic grammar, punctuation, spelling, proofreading, and other language skills needed in word processing.
- 1246 English Grammar 1 4**  
Helps secretarial students to master the English language through analysis of sentence structure.
- 1247 English Grammar 2 4**  
Helps students master English language skills through study of agreement, case, punctuation, usage, and modifiers.
- 1250 Shorthand 5 4**  
Focuses on technically specialized materials.
- 1253 Word Processing - Principles and Systems 3**  
Introduces history and concepts of word processing systems. Offers practical experience in the operation of complete word processing systems. Includes use of various types of hardware and software.
- 1255 Word Processing Fundamentals 4**  
Introduces theory, terminology, procedures, and career possibilities in word processing. Examines input, output, processing, control, and feedback from the status of equipment, personnel, and procedures. Also presents methods of determining the feasibility of implementing new equipment in the office.
- 1256 Word Processing Operations 4**  
Provides practical training on word processing equipment. Emphasis is placed on English grammar principles and proofreading skills.
- 1257 Word Processing Applications 4**  
Offers experience in applying word processing operations toward solving problems and developing projects.
- 1258 Magnetic Keyboard Typewriting 4**  
Introduces recording procedures, revision, and repetitive letter techniques on a memory typewriter.

- 1260 Shorthand 6** **4**  
Presents speed building, new matter dictation, and some transcription work on the production of mailable copy. Attention is given to technical terminology, phrases, and abbreviations specific to certain organizations.
- 1261 Administrative Office Practice** **3**  
Emphasizes skills, techniques, and attitudes necessary for successful office practice. Attention is given to human relations, use of office machines, business correspondence, mailing, filing, telephoning, personal hygiene, dress, and interviewing for the job. Offers opportunities to apply business skills and knowledge in a laboratory situation.
- 1262 Typewriting 5** **4**  
Focuses on production techniques pertaining to correspondence, business forms, manuscripts, tabulation, secretarial projects, and transcription of machine-recorded dictation. Emphasis is placed on grammar, spelling, and letter format.
- 1264 Intensive Secretarial Laboratory 1** **6**  
Provides opportunities to gain secretarial experience and skills in a simulated office environment.
- 1267 Machine Dictation and Transcription** **2**  
Develops transcription and communication skills, integrating those learned in other areas, such as typing and technical and business communications. Broadens the student's marketable skills with training in the use of machine transcription equipment.
- 1268 Machine Transcription for Word Processing** **4**  
Instructs in the use of transcription machines, with emphasis on spelling, punctuation, and the production of a mailable transcript.
- 1270 Introductory Typewriting (Non-majors)** **3**  
Presents fundamentals of touch typewriting to beginners.
- 1271 Clerical Office Procedures (Non-majors)** **5**  
Explores the range of employment opportunities available in the clerical field. Examines the requirements and qualifications for specific positions.
- 1274 Supervision of Word Processing Operations** **4**  
Studies the management and supervision of a word processing system. Demonstrates starting and stopping the system components, care of the printer, archiving and deleting documents to avoid system overload, use and maintenance of production logs, performance of control operations tasks, and supervising the work of the other operators in the office.
- 1275 Word Processing Files Management** **4**  
Demonstrates how to create, use, change, and update files on the IBM 5520 Administrative Word Processor or equivalent system.

### **1310 Legal Terminology** **2**

Studies ethics of law, professional conduct, words using Latin prefixes and suffixes, word roots, combining forms, spellings, and use of the legal dictionary.

### **1313 Legal Office Bookkeeping** **4**

Introduces principles and practices of bookkeeping relevant to the legal office. Covers debit and credit, double entry, and use of journals. Analyzes transactions, posting procedures, and cash and accrual bases of accounting. Attention given also to handling petty cash, banking procedures, payroll, work sheets, balance sheets, and income statements.

### **1321 Legal Office Procedures** **4**

Studies secretarial and bookkeeping duties and responsibilities associated with the legal profession. Includes legal correspondence and records, client files and filing, financial administration, contact procedures with clients, courts, and professional agencies. Attention given also to desirable personality traits, interpersonal relationships, and attitudes within the law office.

### **1331 Legal Office Communications** **3**

Develops communications skills required in the legal office, with emphasis on oral and written communications.

### **1341 Legal Office Practice** **4**

Offers opportunities to apply business skills to legal forms and procedures in a laboratory situation. Coursework includes research assignments and maintenance of legal calendars and files. Emphasizes skills, techniques, and attitudes necessary for successful office practice. Attention is given to human relations, use of office machines, business correspondence, mailing, filing, telephoning, personal hygiene, dress, and interviewing for the job.

### **1342 Typewriting 4 - Legal** **4**

Improves production typewriting skills, with emphasis on the preparation of legal documents.

### **1345 Shorthand 4 - Legal** **4**

Develops competence in specialized legal dictation and in transcription of legal correspondence, forms, and documents. Emphasis is placed on constructing shorthand outlines of legal terms.

### **1432 Medical Machine Transcription** **2**

Reinforces the student's command of medical terminology, including names of medical science fields and specialties, common drugs, and diseases. Includes study of prefixes, suffixes, and abbreviations used in medical transcription.

## Visual Communications Technologies

- |   |          |
|---|----------|
| <b>1610 Photography 1 (Non-Majors)</b>  | <b>2</b> |
| Introduces picture-taking and darkroom techniques to the student with little or no background in photography.   |          |
| <b>1614 Photography 1</b>   | <b>2</b> |
| Presents the fundamentals of black and white photography and film developing and printing.  |          |
| <b>1615 Photographic Science and Theory 1</b>   | <b>3</b> |
| Studies camera types, exposure meters, and darkroom chemistry, with attention to types of films and photographic papers.  |          |
| <b>1616 Studio Practice 1</b>   | <b>2</b> |
| Demonstrates studio equipment and setup procedures, with emphasis on use of one light and reflectors.   |          |
| <b>1624 Photography 2</b>   | <b>2</b> |
| Studies composition, camera techniques, and black and white darkroom processes.   |          |
| <b>1625 Photographic Science and Theory 2</b>   | <b>3</b> |
| Studies light, lenses, and black and white developers.  |          |
| <b>1626 Studio Practice 2</b>   | <b>2</b> |
| Demonstrates the use of multiple light setups to achieve proper ratios and exposures. Attention is given also to diffusers, barndoors, scrims, and snoots.                                      |          |
| <b>1627 Darkroom Techniques 1</b>   | <b>2</b> |
| Introduces black and white film and print processing.   |          |
| <b>1628 Darkroom Techniques 2</b>   | <b>3</b> |
| Studies contrast control in film and print processing, techniques for consistency in black and white printing and processing, and darkroom troubleshooting. Also compares and tests developers. |          |
| <b>1632 Architectural Photography 1</b>   | <b>2</b> |
| Demonstrates techniques of photographing architectural structures, both interior and exterior.  |          |
| <b>1633 Sensitometry 1</b>  | <b>2</b> |
| Estimates the response of photographic materials to radiant energy. Attention is given to methods of exposing, processing, measuring and evaluating data.                                       |          |

- 1634 Sequential Photography** **3**  
Presents use of the photograph as an illustrative tool for story telling.
- 1635 Product Photography** **3**  
Introduces the photography of table-top and larger products. Demonstrates setup and lighting techniques used in commercial photography.
- 1636 Studio Practice 3** **2**  
Provides practice in the use of view cameras and filters.
- 1638 Darkroom Techniques 3** **2**  
Studies the use of live film. Includes processing of color transparencies, color negatives, and color prints.
- 1640 Architectural Photography 2** **3**  
Studies the photographing of more complex architectural situations. Emphasis is placed on small and large room interiors with artificial light.
- 1641 Sensitometry 2** **3**  
Deals with all aspects of color transmission and reflective sensitometry, using color prints, negatives, and transparencies. Includes processing, analysis, and graphing of color test strips.
- 1642 Industrial and Commercial Techniques 1** **2**  
Studies the use of view cameras in controlling perspective and distortion. Attention is given to problems of lighting and shooting on location.
- 1644 Studio Practice 4** **2**  
Studies the lighting of unusual objects and materials, including large objects and those made of glass, chrome, plastic, and wood.
- 1645 Photographic Composition** **3**  
Studies the principles of photographic composition.
- 1650 Advanced Photographic Composition** **2**  
Emphasizes the development of individual style.
- 1652 Industrial and Commercial Techniques 2** **3**  
Instructs in the production of photographs for reproduction, with special emphasis on parts catalog shots and exploded views.
- 1654 Product Illustration** **2**  
Studies illustrative aspects of photography as applied to commercial products.
- 1655 Portrait Lighting** **2**  
Introduces studio portrait lighting techniques and equipment.

- 1660 Black and White Portraiture** **2**  
 Demonstrates specialized techniques used in the photographing and printing of black and white portraits.
- 1661 Photographic Science and Theory 3** **3**  
 Studies color photography, including transparencies, negatives, prints, and processes.
- 1662 Industrial and Commercial Techniques 3** **3**  
 Explores techniques of painted light, rear screen projection, and product illustration.
- 1663 Color Portraiture** **2**  
 Demonstrates specialized techniques used in the photographing and printing of color portraits.
- 1664 Negative Retouching** **2**  
 Demonstrates retouching techniques for black and white portrait negatives.
- 1665 Custom Color Printing** **2**  
 Offers comprehensive study of the theoretical and practical aspects of color photography.
- 1668 Specialized Commercial Techniques** **3**  
 Demonstrates specialized techniques used in commercial photography, with special attention to lighting, camera work, and processing.
- 1671 Advanced Portraiture** **2**  
 Offers advanced study of portraiture, including group portraits and special effects.
- 1672 Industrial and Commercial Techniques 4** **3**  
 Studies techniques of photographic situation illustrations, architectural structures, and night exposures.
- 1673 Advanced Product Photography** **2**  
 Presents large format color product photography.
- 1674 Journalistic and Editorial Photography** **2**  
 Studies the production of photographs designed to tell a story. Includes the writing of captions.
- 1675 Specialized Industrial Techniques** **2**  
 Presents specialized photographic techniques used in industry. Includes time-motion study photographs, stress studies, and infrared photography.



- 1676 Advanced Darkroom Techniques** 2  
Demonstrates rapid access processing, production of contrasts masks and internegatives, and use of color analyzers.
- 1678 Color Negative Retouching and Print Finishing** 2  
Demonstrates the retouching of color negatives and prints, using modern materials and methods.
- 1680 Natural Light Portraiture** 2  
Studies techniques of photographing people by natural light. Attention given to posing, camera work, and use of special equipment.
- 1681 Portfolio Preparation** 3-5  
Assists students in producing the photographs needed for their portfolios.
- 1804 Videotaping Processes** 2  
Introduces the theory, use, and manipulation of videotape equipment.
- 1805 Audiotaping** 2  
Introduces the theory and practice of audiotaping.
- 1806 Audiovisual Slide Production** 2  
Demonstrates the entire process of multimedia presentation, from the establishment of objectives to evaluation.
- 1808 Portfolio Preparation 1** 3  
Assists the student in the preparation of a portfolio for job interviews. Includes evaluation, finishing, and scheduling processes.
- 1810 Composition and Design Fundamentals** 2  
Studies the fundamentals of composition and design, including tonal relationships, color complements, and contrasts. Explores the elements and applications of two-dimensional design.
- 1811 Illustration Media** 2  
Introduces techniques of watercolor, gouache, and acrylic.
- 1812 Drawing Fundamentals** 2  
Studies the basic concepts and techniques of drawing, with special attention to media use, perspective, and accuracy through use of line and mass of volume.
- 1813 Visual Arts Careers Orientation** 2  
Investigates opportunities in the visual arts. Includes job research, terminology, interviews, field observations, and collection of career information.

- 1814 Drawing Techniques 1** **2**  
 Develops drawing skills through use of basic media.
- 1815 Composition and Design Techniques 1** **2**  
 Presents two-dimensional concepts and shapes, chroma, value, and applications.
- 1816 Illustration Techniques 1** **2**  
 Develops dexterity in the application of transparent and opaque aquamedia.
- 1820 Composition and Design Techniques 2** **2**  
 Studies three-dimensional concepts of visual imagery and color optics and dynamics. Attention is given to the illusion of 3D and the actuality of form. Also includes the use, limitations, and physical manufacture of 3D materials for commercial use.
- 1821 Illustration Media 2** **2**  
 Concentrates on aquamedia, with attention to various media applications.
- 1822 Drawing Techniques 2** **2**  
 Provides further training in pencil and ink and introduces felt pen techniques. Emphasis is placed on accuracy and quality of work.
- 1823 Illustration Techniques 2** **2**  
 Presents projects that involve the application of aquamedia techniques, such as background and spot and product illustration.
- 1824 Typography Techniques** **2**  
 Presents methods of spacing, line count, comping, and letter forms for layout and finished art applications.
- 1825 Creative Typography** **3**  
 Studies the use of type as a design element in visual art. Includes lectures, demonstrations, and projects.
- 1826 Air Brush Rendering** **2**  
 Presents concepts and practices concerning the use of the air brush to render visuals in black and white and in color.
- 1827 Mixed Media Figure Drawing** **2**  
 Presents concepts and practices concerning the use of two or more media in combination for visual effect and impact.
- 1828 Multimedia Figure Drawing** **2**  
 Discusses concepts and problems pertaining to various media used in figure illustration. Examines the advantages and disadvantages of each medium.

- 1830 Typographic Theory** **3**  
Introduces typography and its many uses.
- 1831 Black and White Illustration** **2**  
Offers concentrated study in black and white illustration for reproduction.
- 1832 Photography Fundamentals** **3**  
Presents theories and applications of basic camera types. Emphasis is placed on the relationships of photography to commercial art and illustration.
- 1834 Black and White Media Techniques** **2**  
Presents techniques used in pen and ink, dry brush, gouache, and other black and white media. Also demonstrates the use of mechanical instruments for work in black and white.
- 1835 Sketch Book Drawing** **2**  
Introduces anatomy through spontaneous drawing and visual perception.
- 1836 Visual Arts Processes** **2**  
Explores problems of visual communication. Examines ways in which the artist shapes the environment.
- 1840 Layout Design Fundamentals 1** **2**  
Presents concepts of layout and their relationships to finished art. Also studies use of various media and materials.
- 1841 Airbrush Photo Retouching** **2**  
Presents studio projects in photo retouching, from light to cut-away retouching techniques.
- 1842 Layout Design Techniques 1** **2**  
Demonstrates drawing, composition, and layout techniques as applied to brochures, ads, and direct mail projects.
- 1843 Life Drawing Anatomy** **2**  
Studies anatomical renderings of the skeletal-muscular formations of the torso, limbs, and cranial areas of the human body.
- 1845 Life Drawing Techniques 1** **2**  
Offers intensive studio work in life drawing, with emphasis on the use of the human figure in illustration.
- 1847 Keylining Fundamentals 1** **2**  
Demonstrates the preparation of art for printing.

- 1850 Layout Design Fundamentals 2**  
Studies concepts of layout design and techniques of visualization as they pertain to format, reproduction, and finished art.
- 1851 Illustration Concentration 1 3**  
Develops skills in a selected area of illustration through studio projects designed by the instructor and students.
- 1853 Figure Rendering 2**  
Offers studio projects in the rendering of the human figure as used in illustrations.
- 1854 Layout Design Techniques 2**  
Applies layout concepts in single to process color visuals, using rough, semicomprehensive, and comprehensive techniques.
- 1855 Creative Illustration Concepts 2**  
Studies visual techniques, including vignetting, resist impasto, flat pattern, and scale, with emphasis on the position of elements on the illustrative field.
- 1856 Creative Illustration Methods 2**  
Consists of studio projects in high design, using creative techniques.
- 1857 Figure Drawing for Layout 2**  
Studies the execution of draped and undraped figures to achieve lifelike situation visuals for layout.
- 1858 Storyboard Techniques 2**  
Studies storyboards as visual tools for 35mm and TV formats. Attention is given to field size and position and to quality of visual techniques.
- 1859 Illustration Concentration 2 3**  
Consists of illustration projects selected and designed by students and professionals, with emphasis on quality, completion time, and suitability of purpose. Students will execute the projects, where possible, under the direction of a field professional.
- 1860 Keylining Techniques 1 2**  
Develops techniques in keylining, with emphasis on line and halftone art requirements for reproduction.
- 1861 Storyboard Concepts 2**  
Consists of studio projects in multifield sizes, sequencing and value, and chromatic alignment.
- 1868 Special Darkroom Techniques 3**  
Studies photographic processes, chemicals, and paper.

- 1869 Darkroom Processes** **2**  
Studies photographic processes, chemicals, and paper
- 1870 Keylining Fundamentals 2** **2**  
Studies keylining in relation to mechanical specifications, camera-ready preparation, and multiple-page signatures.
- 1871 Audiovisual Art Design** **2**  
Studies the preparation of charts, graphs, flip charts, transparencies, and slides used in audiovisual communication processes. Includes lectures, discussion, and projects.
- 1872 Keylining Techniques 2** **2**  
Consists of studio projects in two-and four-page signatures with all live visuals in position.
- 1873 TV Art Design** **2**  
Studies the execution of art produced for direct or slide use on TV, with emphasis on chron and value alignment and field size and organization.
- 1874 Medical Illustration** **2**  
Presents concepts, practices, and projects pertaining to illustrative techniques unique to the medical profession. Projects are coordinated with local medical organizations to assure applicability of concept and technique.
- 1881 Technical Illustration** **2**  
Presents concepts and techniques relating to technical illustration, with emphasis on detail configurations and visual clarity. Special attention is given to ultraways and exploded views.
- 1883 Specialized Layout Concepts** **2**  
Studies layout techniques specific to catalogs, house organs, annual reports, and similar publications, with special emphasis on continuity and suitability of format.
- 1884 Specialized Layout Techniques** **2**  
Consists of studio projects in the design and layout of specialized publications. Stresses concept continuity, efficiency of space utilization, and practicality of production
- 1885 Portfolio Preparation 1** **3-5**  
Assists the student in the preparation of a portfolio for job interviews. Covers evaluation, finishing and scheduling processes.
- 1886 Portfolio Preparation 2** **3-5**  
Assists the student in the execution and finishing of art work for the portfolio. Includes discussion of contents to correct any remaining weaknesses.

### **1898 Seminar on Advertising Media 1 3**

Offers credit hour awards for participation in the planning and production of the annual meeting of the Seminar on Advertising Media.

### **1899 Seminar on Advertising Media 2 3**

Offers credit awards for continued participation in planning and production of SAM.

### **1901 Audio Production 2**

Demonstrates intermediate techniques in audio scripting, recording, editing, and duplication, using reel-to-reel and cassette equipment.

### **1902 Video Production 1 3**

Concentrates on the planning and execution of a videotape production. Includes continuity and shooting to accommodate post- production titling and editing. Attention given to the lighting and micing of a television set.

### **1903 Video Production 2 3**

Introduces techniques used in a multicamera studio television production, including different types of lighting, coordination of sound systems to video, functions of personnel, and various studio tasks.

### **1904 Audiovisual Electronics 2**

Presents electronic theory, principles, and practices as applied to audiovideo equipment and still-frame systems.

### **1905 Video Systems Design 2**

Demonstrates how to design an editing and production system for color videotape production, how to produce color video to script instructions, and how to master a finished videotape, using 3/4" heterodyne color systems, time code editing, and mastering techniques.

### **1906 Script Writing for TV 1 2**

Provides exercises in the writing of production and content scripts for videotaping. Students will produce scripts oriented to specific markets, such as public information, industrial training, or educational instruction.

### **1907 Script Writing for TV 2 2**

Teaches advanced techniques in scriptwriting for television, with focus on organization of content, camera instructions, talent queues, shooting lpb, and taping sequencing.

### **1908 Color Slide Production 3**

Introduces 35mm photography for multi-image production.

- 1909 Kodalith Slide Production** **3**  
 Demonstrates how to make line film negatives from black and white artwork and line conversions from continuous tone originals.
- 1910 Audio Recording for Slide Production** **2**  
 Teaches techniques of producing finished audiotapes, using narrative, sound effects, and background music. Special emphasis is placed on still-frame pacing.
- 1911 Multi-Image Design** **3**  
 Outlines the planning required to produce a 35mm multi-image slide show. Studies the visual imagery needs, sequencing of the image, supportive sound, and the techniques used in microprocessor system programming.
- 1912 Multi-Image Slide and Sound Production** **4**  
 Demonstrates how to program a multi-projector, multi-image slide presentation with supportive audio narrative, special effects, and music. The student will produce slides and finished audiotapes for a slide program.
- 1913 Advanced Color Video Production—Prerequisites: 1983, 1984** **4**  
 Studies advanced techniques of color videotape production, lighting, and control. Includes production staff assignment, coordination of personnel, production costing, and post production techniques. Special attention given to the use of direct color video systems for mastering, editing, and duplicating working tapes.
- 1914 Advanced Audio Production** **2**  
 Studies techniques used in multiple miced audio recording. Includes acoustical theory and practice. Demonstrates special effects editing and overdubs for producing finished audiotapes.
- 1930 Radio and Television** **2**  
 Includes study of operating parameters, assigned frequencies, dissemination methods, media formats, equipment, studio rates, and operation of broadcast radio and television stations.
- 1931 Audiovisual Distribution Systems Design** **2**  
 Provides study and project exercises in AV systems selection and design for specific users.
- 1932 Script Writing 1 - Slide Presentation** **3**  
 Develops skills in organizing subject content and semantics of message vocabulary as used in narrative scripts for audiotapes.
- 1942 Videotape Production** **3**  
 Provides exercises in the production of 1/2" black and white VTR tapes. Students will produce finished VTR tapes with "live" voice, voice-over, titles, and signatures. Students will also conduct VTR taping of evaluative feedback exercises.

### **1953 Color Videotape Production 3**

Presents techniques in color videotape production, with special emphasis on color balance, multiple camera and microphone systems, voice and music mixing, deck-to-deck editing, and titling. Projects include both studio and location tape production.

### **1961 Videotape Editing 2**

Offers projects in video editing, entailing multiple image and audio manipulation.

### **1963 Sound Recording and Editing 3**

Provides exercises in sound system design, including microphone types, transducers, editing, and mixing on single-track tape.

### **1972 Motivating Psychology 3**

Studies principles and methods of psychology. Students will apply their understanding of motivational principles to projects designed to elicit predictable audience reaction and behavior.

### **1973 AV Systems for Government and Education 2**

Covers design and systems setup for government and educational use, with emphasis on in-house training, PR utilization, and personnel evaluation systems.

### **1982 Video Systems Maintenance 4**

Offers training and practical experience in light maintenance and repair procedures for VTR decks, camera, and sound systems.

### **1983 Special Effects in Color 4**

Focuses on special effects in photography and TV media.

### **1984 Advanced VTR Production 4**

Guides the student in producing a finished videotape with live broadcast capabilities and quality. Covers scripting, titling, editing, sound and video mixing, and both studio and externalized taping.

### **1985 Multitrack Sound Systems 3**

Presents projects in sound system design. Attention is given to special effects, such as echo, reverberation, and dolby.

### **1988 Sound Recording and Editing 3**

Offers practical exercises in sound system design, including microphone types, transducers, editing, and mixing on single track tape.

### **1989 Audiovisual Equipment Utilization And Maintenance 2**

Provides exercises in setup, tear-down, storage and light maintenance of AV systems, such as 16 mm movie projection systems, VTR recording and playback systems, O.H.P. systems, and audio recording and playback.



**2010 Composition and Design 1 3**

Studies the elements of two-dimensional design and their use in creative work in interior design. Also studies principles of drawing flat elevations.

**2011 Color Theory 3**

Includes intensive study of color theory, with emphasis on expression, range, key, and color psychology. Explores the effects of living with color on the individual and the family. Applies practical solutions to problems concerning the use of color.

**2012 History of Art 1 3**

Surveys art from prehistoric times through the Rococo period, placing the major periods of art history in sociocultural context. Attention is given also to art as it relates to the artist and society.

**2013 Structural Design 1 4**

Studies fundamentals of drafting and use of the drafting equipment and building materials used in architectural structures.

**2018 History of Art II 3**

Surveys painting, sculpture, and architecture from the Rococo period to the present.

**2020 Composition and Design 2 3**

Covers 3-dimensional concepts pertaining to perspective drawings. Teaches how to execute renderings of actual rooms for presentation to clients.

**2021 Textiles 1 3**

Studies textile fibers, weaves, finishes, yarns, and dyeing processes, demonstrating how each is used by the professional designer.

**2022 Interior Design 1 3**

Introduces study of window treatments and coverings, wall treatments, lighting, accessories, architectural and furniture styles, and elements and principles of design.

**2023 Structural Design 2 3**

Students design and draw blueprints for residential structures of their choice.

**2031 Textiles 2 3**

Emphasizes textiles as used in the field of interior design. Covers physical properties and characteristics of carpets, wall coverings, upholstery, and draperies.

**2032 Furniture Styles 1 3**

Surveys the development of furniture styles and interior design from ancient times through the Rococo period.

**2033 Furniture Styles 2 3**

Surveys the development of furniture styles and interior design from the Rococo to the present day.

**2041 Furniture Selection 3**

Teaches students to recognize quality furniture through study of construction techniques. Identifies furniture types and details, furniture woods as to color and grain-ing, and common size standards for various pieces.

**2042 Advanced Textiles 4**

Examines problems in estimating and installing carpet, drapery, and wall cover-ings. Students research and execute textile projects for class presentation.

**2044 Environmental Psychology 4**

Emphasizes the relationship between the individual and his immediate and extended surroundings. Explores ways in which the five senses, especially sight, affect our perception of comfort.

**2050 Applied Interior Design 1 4**

Case studies with residential applications provide experience for the student in resolving problems by means of cost and time accounts and purchase orders.

**2051 Display 1 3**

Studies the principles of display and the special techniques and equipment required in display work.

**2052 Professional Practices 3**

Deals with the business aspects of the interior design profession. Topics include business and legal paperwork, the formation of the organization, client job files, and ordering procedures.

**2053 Furniture Arrangement and Space Planning 3**

Analyzes existing conditions of interiors and applies practical solutions, using basic floor plans and assigned furnishings. Students progress to more advanced floor plans and designs.

**2060 Applied Interior Design 2 4**

Provides field experience in solving problems in interior design. Emphasizes the application of previously learned principles and techniques of creative display to problems in case studies.

**2061 Display 2 3**

Offers further study of the principles of display and the special techniques and equipment required in display work.

- 2062 Salesmanship** **3**  
 Surveys sales of and selling techniques for services and products. Covers all phases of selling, including approach, demonstration, close, and departure.
- 2063 Space Planning - Commercial** **2**  
 Offers student projects in commercial planning, with attention to personnel task performance, traffic, environmental control, wear and maintenance, and budget cost control. Covers fixtures, retail management, store services, marketing, merchandising, and pricing.
- 2070 Space Planning - Production** **2**  
 Studies production space planning techniques for all types of manufactured housing. Attention is given to floor plans, mass production, capabilities of design, visual alterations of home without major structural changes, materials selection versus quantity purchasing and volume, and amortization of special design features. Also includes code requirements, anticipated life span of the structure, and wear use factors for specialized structures.
- 2071 Lighting Techniques** **3**  
 Studies techniques and special effects of lighting relevant to all aspects of interior design.
- 2072 Installation Procedures** **2**  
 Studies the specifications for interior materials and methods of installation.
- 2073 Kitchen and Bath Planning** **2**  
 Studies space requirements and standard cabinetry for kitchen and bath.
- 2074 Office Environments** **3**  
 Studies space planning based on flexible systems to accommodate changing commercial needs.
- 2075 Support System Planning** **3**  
 Studies requirements and space planning for kitchens, baths, and support systems. Considers standardization of cabinetry and fixtures, as well as expectations for the areas, in the planning process.
- 2076 From Contract to Accessories** **3**  
 Focuses on the sequence of installation procedures for a job from the signing of the contract to completion of the job. Attention is given to the selection of accessories and to specific procedures for the installation of certain kinds of materials.
- 2210 Type Composition for Reproduction** **2**  
 Introduces photo typesetting, emphasizing operations and the capabilities of equipment to produce materials.

**2211 Art and Copy Preparation 2**

Studies principles of layout and design and the use of various tools, materials, and equipment for different types of layout.

**2212 Layout and Stripping Flats 2**

Provides instruction and practice in basic operations involved in layout and stripping flats for black and white reproduction work. Includes the use of various tools, materials, and equipment.

**2213 General Printing Processes 2**

Focuses on operations preceding and following press work, including the preparation of inks, fountain solution, and other supplies used by the printer. Attention is given also to the use of bindery equipment on the finished product.

**2214 Camera Fundamentals 2**

Provides instruction in the operation of process cameras, emphasizing line photography techniques. Offers practice in the fundamentals of camera and darkroom procedures.

**2215 Plate-Making Fundamentals 2**

Covers fundamentals of plate processing and development. Offers practice with the tools, materials, and equipment used by the plate maker.

**2216 Offset Presswork Fundamentals 3**

Provides instruction and practice in operational procedures for the small press duplicators commonly used in black and white offset presswork.

**2221 Camera Line and Halftone 2**

Covers methods and techniques of transforming continuous tone copy into printable halftones. Provides understanding of densitometry, halftone computer wheels, screens, screen ranges, flash exposures, effects of highlights, and show range. (Requires experience in line negative work).

**2222 Stripping Line and Halftone Negatives 2**

Presents different methods of stripping line and halftone combinations. Includes double burns, step and repeat, work and turn, register systems, and mechanical color.

**2223 Photo Offset 2**

Offers experience with the larger duplicating presses used in photo offset work. Gives thorough grounding in offset fundamentals.

**2224 Printing Estimating 3**

Teaches the student how to estimate the cost of printing jobs. Includes the handling of customer requests and computing the costs of paper, typesetting, press, and binding.

- 2225 Offset Presswork 1** **3**  
 Offers experimental presswork relating to halftones, register work, work and turn, and mechanical color printing. Stresses accuracy in all phases of operation.
- 2231 Advanced Camera** **2**  
 Trains students to shoot negatives of mechanical color for 3-, 4-, or 5-color work. Stresses registry of all work. Students are expected to be able to handle any camera work given them at this time.
- 2232 Offset Presswork Operations** **2**  
 Completes material begun in Offset Presswork 1 (2225), with special care taken in press set.
- 2233 Offset Presswork 2** **3**  
 Develops neatness and accuracy in ink coverage and registry of each sheet printed. Students are expected to handle work of longer duration on any type of duplication in the lab.
- 2240 Special Effect Camera Work** **2**  
 Covers duotones, special effect screens, shooting techniques, and film development. Students are encouraged to experiment with special effects under the guidance of the instructor.
- 2241 Printing Production Practice** **2**  
 Introduces the preparation, cleaning, and operation of the press.
- 2242 Press Troubleshooting** **2**  
 Demonstrates how to detect and correct malfunctions to insure uninterrupted press runs. Emphasizes correct setting of damping and inking systems, pull-out roller, stop fingers, and feed rollers.
- 2243 Offset Presswork 3** **3**  
 Offers experience in full production runs, using the larger presses of the printing laboratory.
- 2244 Ink and Paper for Offset** **2**  
 Discusses the manufacture of ink and paper and special problems arising from their different properties. Includes identification of papers and mixing of ink.
- 2251 Special Problems in Offset Preparation** **3**  
 Covers activities and responsibilities related to printing, including supervision of workers in the printing field. Special projects are designed to help students in any areas of deficiency.
- 2252 Manufacturing and Organization** **3**  
 Studies the duties of the first-line supervisor and other management personnel and problems of management encountered in a manufacturing organization. Covers

the establishment of lines of authority, duties, and responsibilities, and the rules for charting an organizational structure. Also reviews manufacturing, engineering and research, industrial engineering, materials management, process and product control, facilities planning, plant engineering, and manufacturing information systems.

### **2253 Supervision 1 3**

Studies management and supervision, including responsibilities of the supervisor, delegation of authority, functioning within the organizational structure, communications, motivation, interviews, orienting and inducting new employees, and evaluation of employee performance.

### **2254 Supervision 2 3**

Offers further study in management and supervision, including responsibilities of the supervisor, delegation of authority, functioning within the organizational structure, communications, motivation, interviews, orienting and inducting new employees, and evaluation of employee performance.

### **2255 Printing Specialization 4**

Provides opportunities to develop skills in selected areas of printing technology.

### **2262 Production Controls 3**

Develops the ability to oversee a number of simultaneous operations in a typical print shop. Introduces inventory controls, use of vendors' catalogs, and ordering of equipment.

### **2263 Phototypesetting 3**

Teaches basic phototypesetting concepts, terms, and operations. Students perform all typesetting formats within the capability of the machine.

### **2264 Preventive Maintenance 2**

Develops preventive maintenance programs for all areas of printing. Demonstrates how to establish maintenance schedules and how to check equipment for wear. Itemizes the supplies and equipment necessary for a comprehensive maintenance program.

### **2415 Audiovisual Equipment Operations and Maintenance 3**

Demonstrates the operation of various types of AV equipment and basic maintenance for hardware items.

### **2417 Library and Learning Resource Center Fundamentals 1 3**

Introduces the major phases of library and learning resource center operations, especially as they pertain to the roles of library aides. Includes library history and systems, organizational patterns, technical and public services, and media systems.

### **2418 Library and Learning Resource Center Fundamentals 2 3**

Introduces the types of library materials and their organization, characteristics, and use in support of the library's function. Emphasizes reference service and a thorough knowledge of standard reference tools.

**2419 Library Forms and Records 3**

Introduces standard library forms and methods of record keeping pertaining to shelf listing, serials control, and filing.

**2425 Audiovisual Productions 3**

Guides the student in the production of various types of audiovisual software.

**2427 Library Operations and Practices 5**

Prepares the student to perform service operations and to meet the service demands of patrons. Offers practical experience in a broad range of library tasks, including circulation and reference services, vertical file maintenance, and displays.

**2428 Library Technology Seminar 4**

Provides opportunity to examine special problems or topics of current interest with the aid of group discussion and guest speakers.

**2443 Health Science Library 3**

Introduces hospital organizational structures and standards for hospital libraries. Familiarizes students with the basic reference and bibliographic tools used to provide information services in the health sciences.

## **Human Services and Health Technologies**

**2601 Child Care 4**

Presents fundamentals of child care. Includes theories of discipline, self-concept development, scheduling of child care programs, and philosophies of early childhood educators.

**2610 Child Growth and Development 4**

Introduces study of the physical, social, emotional and mental development of the preschool child. Gives attention to the influence of cultural environment on development and to individual differences in development.

- 2612 Childhood Health** **3**  
 Instruction in basic health and illnesses pertaining to early childhood.
- 2623 Cognitive and Creative Activities** **3**  
 Studies the cognitive and creative activities of young children. Includes analysis of play situations appropriate to the needs and abilities of three to five-year-old children; also includes instruction and practice in teaching and supervising the cognitive and creative activities of young children.
- 2624 Child Care Participation 1** **4**  
 Provides opportunity for practical experience through observation and supervised participation in child care agencies.
- 2625 Legal Aspects of Child Care** **3**  
 Studies professional organizations, child care laws, licensing requirements, and ethical and legal responsibilities of the child care team.
- 2626 Science and Social Studies for Preschool Children** **4**  
 Instructs students in preschool education methods in the areas of science and social studies.
- 2627 Child Care Seminar 1** **2**  
 A companion course to Child Care Participation I (2624), with emphasis on the application of child care and development theories.
- 2631 Child Care Participation 2** **4**  
 Provides further opportunity to gain practical experience in child care agencies, with a change of center and supervising teacher.
- 2633 Community Resources** **2**  
 Develops good working relationships with parents and employers and with leaders and members of the community. Teaches the student how to make effective use of community resources.
- 2637 Child Care Seminar 2** **2**  
 A companion course to Child Care Participation 2 (2631), with emphasis on application of child care and development theories.
- 2642 Nutrition and Meal Planning** **4**  
 Focuses on the nutritional needs of preschool children and the state regulations for feeding programs in child care centers. Demonstrates ways to instill nutritional values in preschool children.
- 2643 Preschool Art** **4**  
 Presents the methods, techniques, and materials used in art education for young children.



- 2645 Child Care Participation 3** 4  
Provides further opportunity to observe and participate in child care agencies, with a change of center and/or supervising teacher and age group of children.
- 2647 Child Care Seminar 3** 2  
A companion course to Child Care Participation 3 (2645), with emphasis on application of child care and development theories.
- 2651 Language Arts for Children** 4  
Presents methods and techniques useful in the development of language skills in preschool children.
- 2654 Child Care Participation 4** 4  
Provides further opportunity to observe and participate in child care agencies, with a change of center and/or supervising teacher and age group of children.
- 2655 Bookkeeping** 4  
Introduces principles of bookkeeping pertaining to the medical office. Includes debit and credit, double entry bookkeeping, use of ledgers and journals, transaction analysis, posting procedures, cash basis of accounting, handling petty cash, banking procedures, payroll, depreciation of accounts, balance sheets, work sheets, and income statements.
- 2657 Child Care Seminar 4** 2  
Emphasizes improvement of children's communication skills and management of behavior problems.
- 2660 Preschool Music** 4  
Instruction in the planning of musical activities for preschool children. Includes use of songs, records, and simple instruments for group activities.
- 2661 Management Techniques** 4  
Introduces the principles of managing a child care agency. Emphasizes the role of the manager in relation to agency personnel. Staff interpersonal relationships and funding sources are also discussed. Resume writing and job-seeking skills are stressed.
- 2663 Audiovisual Materials and Methods** 4  
Introduces the use of audiovisual equipment, techniques, and materials. Students are actively involved in preparing a teaching packet for use with preschoolers.
- 2665 Child Care Participation 5** 4  
Provides further opportunity to observe and participate in child care agencies, with a change of center and/or supervising teacher and age group of children.
- 2667 Child Care Seminar 5** 2  
A companion course to Child Care Participation 5 (2665), with emphasis on appli-

cation of child care and development theories. Emphasizes improvement of children's communication skills and management of behavior problems.

- 2701 Physical Care** **4**  
 Introduces basic nursing techniques used in the mental health field. Includes administration and preparation of medicine, client programming, and first aid. Emphasizes responsibilities, identification of symptoms, and record-keeping.
- 2702 Behavior Management I** **4**  
 Presents principles of behavior management, techniques of positive reinforcement and behavior shaping, contracting, measurement, task analysis, and application of client programming.
- 2704 Introduction to Human Services** **3**  
 Introduces basic concepts of human services and knowledge of the profession.
- 2710 Clinical 1** **5**  
 Offers supervised experience in techniques of client treatment. Includes observation and participation.
- 2711 Physical Systems 1** **4**  
 Deals with the physical care of clients within a unit. Studies muscular patterns, body systems, seizures, and first aid.
- 2712 Behavior Management II** **4**  
 Examines personalities, attitudes, behavior, and reactions of clients. Attention is given to client relationships, normalization, and participation in outside activities.
- 2713 Human Growth and Development 1** **4**  
 Introduces cognitive, social, and psychological theories of human development from the prenatal period through the adolescent years.
- 2714 Human Growth and Development 2** **4**  
 Studies human development from the adolescent years through later adulthood. Includes adjustment to the roles of adulthood, the aging process, and death and dying.
- 2715 Evaluation and Assessment** **2**  
 Discusses the rationale for assessment, assessment techniques, and evaluation methods. Offers practice in the techniques used to acquire mental health data.
- 2716 Information Management** **2**  
 Introduces and develops skills in obtaining, organizing, disseminating, and evaluating mental health information essential to work in the field. Attention is given to client data, statistical information, and the record-keeping necessary for appropriate treatment.

**2717 Special Populations****3**

Surveys handicapping conditions that stem from dysfunction, illness, and needs of special populations and individuals.

**2720 Clinical 2****5**

Offers further supervised experience in the techniques of client treatment. Includes observation and participation.

**2721 Physiology of the Aging Process****4**

Develops an understanding of the physical and psychological changes that occur with aging. Outlines the necessary adaptations in nursing techniques, approaches to treatment, and patient environment.

**2730 Clinical 3****5**

Offers further supervised experience in the techniques of client treatment. Includes observation and participation.

**2733 Current Issues in Mental Health****3**

Defines the concepts of mentally retarded and developmentally disabled and examines current issues and resources relating to client treatment. Covers Public Law 158, client rights, advocacy, right to treatment, accreditation, evaluation and documentation, least restrictive alternative, normalization, accountability, and problem-oriented record.

**2734 Residential Management****4**

Studies the structure of the client living unit and methods of providing efficient service to the individual client. Includes management of staff, span of control, scheduling, rhythm of life, practical application of normalization, client interaction, and assessment.

**2743 Legal Aspects****4**

Applies the least restrictive alternative, Public Law 158, and J.C.A.H. accreditation requirements to resident programming. Outlines treatment procedures available from policy B-11, including extinction, overcorrection, and restrictive techniques and the legal and ethical considerations of each.

**2760 Therapeutic Recreation****4**

Studies recreation as a form of therapy. Analyzes the modes of recreation used in client programming, including the adaptations of activities to individual needs and specific teaching objectives. Gives attention to gross and fine motor functioning and development and to additional therapy necessary to provide a basis for the therapeutic implementation of recreation.

**2762 Service Delivery Systems****3**

Describes funding sources, systems analysis, community agencies, and the interrelationships of organizations providing services to the developmentally disabled. Offers an integrated approach to service delivery. Includes study of the zone system and specialty facilities.

- 2775 Supervision** **4**  
 Illustrates styles of supervision and methods of directing, utilizing, and delegating human resources. Offers practical experience in simulated situations. Examines personnel policies and the rights of employees.
- 2811 Laboratory Techniques** **4**  
 Introduces elementary skills required in the medical laboratory.
- 2813 Immunohematology Techniques** **4**  
 Studies principles, practices, and laboratory techniques pertaining to the blood bank.
- 2814 Routine Analysis Techniques** **4**  
 Studies principles, practices, and clinical laboratory techniques associated with the routine analysis of body fluids.
- 2820 Hematology Techniques** **8**  
 Presents principles, practices, and laboratory techniques associated with hematology and coagulation.
- 2821 Blood Banking Applications - Immunohematology** **2-6**  
 Studies clinical laboratory blood bank procedures, including detection of blood group system antigens and antibodies, donor screening, hemolytic disease of the newborn, and processing. Special attention is given to the recommendations of the American Association of Blood Banks.
- 2822 Routine Analysis Applications** **1-6**  
 Studies the clinical applications of routine analysis in the hospital laboratory.
- 2823 Microbiology Techniques** **6**  
 Studies the principles, practices, and laboratory techniques associated with microbiology. Includes classification and identification of microorganisms.
- 2828 Advanced Microbiology, Parasitology, and Mycology Techniques** **4**  
 Studies the isolation and identification of rarer pathogenic bacteria and anaerobes. Introduces the collection and processing of specimens and the isolation and identification of fungi, parasites, and mycobacterium.
- 2829 Parasitology and Mycology Techniques** **2**  
 Provides further study in the isolation and identification of rarer pathogenic bacteria and anaerobes, the collection and processing of specimens, and the isolation and identification of fungi, parasites, and mycobacterium.
- 2830 Chemistry Techniques** **8**  
 Studies the principles, practices, and laboratory techniques pertaining to clinical chemistry.

- 2831 Hematology Applications** **4-6**  
 Studies hematological tests and the principles and laboratory techniques pertaining to hematology and coagulation.
- 2832 Immunology Techniques** **4**  
 Studies principles and laboratory techniques pertaining to immunology and serology, with concentration on serological tests.
- 2840 Chemistry Applications** **8**  
 Offers practice in routine chemical analysis in the medical laboratory.
- 2841 Microbiology Applications** **4-6**  
 Studies the applications of microbiology in clinical practices in hospital laboratories.
- 2842 Immunology Applications** **1-6**  
 Studies the applications of serology in the hospital laboratory.
- 2851 General Chemistry** **3**  
 Studies matter in all forms and reactions. Includes basic concepts of atomic structure, bonding, equilibrium, acid-base chemistry, solutions, and chemical calculations. Also introduces principles of organic chemistry and biochemistry.
- 2860 Advanced Chemistry Techniques** **2**  
 Examines the biological functions of cellular constituents, including carbohydrates, proteins, lipids, nucleic acids, and enzymes. Also studies the metabolic processes in the human body.
- 2863 Instrumentation** **3**  
 Presents instrumentation theory and practice as applied to electronic equipment and automated systems in the medical laboratory.
- 2875 Inorganic Chemistry** **4**  
 A systematic study of essential nomenclature, theories, and laws of chemistry. Includes the study of atoms, bonding, ions and molecules, and solutions, with related laboratory procedures.
- 2876 Elementary Organic and Biochemistry** **4**  
 Studies the chemistry of carbon-containing compounds and the biochemistry of lipids, carbohydrates, proteins, nucleic acids and enzymes. Includes related laboratory procedures.
- 2901 Food Preparation Fundamentals** **4**  
 Presents fundamentals of cooking applicable to all types of food preparation. Attention is given to the properties and composition of foods. Also includes menu writing.

**2902 Beverage Management 2**

Studies principles and practices pertaining to the production, selection, purchase, storage, and service of beverages in the food service industry. Students must be at least twenty-one years of age.

**2903 Marketing in Food Service 3**

Studies the development, use, and evaluation of effective merchandising, advertising, and public relation techniques in the food service industry.

**2904 Restaurant Supervisor 4**

Studies theory and practices of customer management and employee relationships.

**2905 Speciality Food Service 3**

Studies the applications of bake shop equipment and baking ingredients in the production of yeast and quick breads, cakes, cookies, pies and pastries, and icings. Special emphasis is placed on decorating procedures and the arts and skills of making baked goods appear attractive. Also includes the development and use of merchandising techniques for baked goods in the food service industry.

**2907 Cost Control in Food Service 3**

Examines cost control techniques for food, beverage, labor, and supplies. Studies the application of cost controls in food service operations.

**3001 Dental Practice 2**

Presents the objectives, qualifications, responsibilities, and scope of the services of the dental assistant. Covers history of the field and legal aspects pertaining to the assistant as a member of the dental health team. Emphasis is placed on terminology relevant to the field.

**3003 Dental Materials and Laboratory 1 4**

Introduces the properties and behavior of dental materials, the proper mode of manipulation, the necessary armamentarium used, and the technical duties of the dental assistant.

**3007 Preclinical Practice 1 5**

Introduces the dental operator and responsibilities of the dental assistant, including housekeeping, assisting the doctor, patient care, equipment and instrument identification, instrumentation, tray setups, effective teamwork, 4-handed dentistry, operative dentistry, and sterilization procedures. Emphasis is placed on practice sessions and use of relevant terminology.

**3008 Dental Anatomy 4**

Acquaints students with oral, head, and neck anatomy, basic embryology, histology, and tooth morphology relating to the dental field. Emphasis is placed on knowledge of materials and terms. Includes drawing and carving of teeth.

- 3009 Health Office Communications** **4**  
 Practices the oral and written communication skills used in medical offices and clinics.
- 3010 Dental Materials and Laboratory 2** **4**  
 Provides further study in the properties and behavior of dental materials, modes of manipulation, armamentarium, and the technical duties of the dental assistant.
- 3011 Preclinical Practice 2** **5**  
 Introduces anesthesia and the following specialties: oral surgery, endodontics, periodontics, pedodontics, orthodontics, prosthodontics, and public health.
- 3012 Oral Pathology/Microbiology** **4**  
 Introduces basic concepts of microbiology, with emphasis on oral microflora. Presents pathogenic problems of the oral cavity, emphasizing signs, symptoms, and prognosis of disease processes. Includes laboratory experiments permitting observation of organisms.
- 3013 Preventive Dentistry/Diet and Nutrition** **3**  
 Emphasizes the importance of preventive dentistry and the effects of diet and nutrition on dental health. Presents techniques of assisting patients in the maintenance of good oral hygiene.
- 3034 Dental Radiography** **5**  
 Covers principles, benefits, effects, and control of X-ray production. Discusses history, radiation sources, modern dental radiographic equipment and techniques, anatomical landmarks, and dental films and processing.
- 3038 Clinical Practice 1** **3**  
 Applies manual skills and knowledge of dental materials and clinical procedures in a simulated office situation with real patients.
- 3039 Dental Office Management** **4**  
 Presents principles of administrative planning, bookkeeping, filing, recall programs, banking, tax records, basic written communications, insurance, office practice, and management as related to the dental office. Attention given to techniques of appointment control, record keeping, and credit and payment plans.
- 3042 First Aid for the Dental Assistant** **4**  
 Prepares the dental assistant in first aid measures required in case of emergency. Covers procedures and techniques, equipment, medications, and postion care of the patient. Reviews anatomy, physiology, and cardiopulmonary rescue as provided by the American Heart Association.
- 3044 Clinical Practice 2** **11**  
 Provides chairside dental assisting experience in private dental practices in both

general and specialized areas of dentistry. Includes weekly seminars as an integral part of the learning experience.

### **3045 Pharmacology for the Dental Assistant 1**

Presents pharmacology as it applies to dentistry and the dental assistant's role. Familiarizes students with the origin, effects, use, and dosages of drugs commonly used in dentistry. Includes prescription writing, use of the metric system, and required state and dental profession safety precautions pertaining to the use of medicaments. Discusses the use of emergency drugs and the maintenance of drug cards for each selected drug.

### **3218 Crash Injury Management 3**

Instructs "first responders" in emergency care skills, preparing them as qualified personnel in crash-related and life-threatening emergencies.

### **3219 Emergency Medical Technician - Ambulance 5**

Presents principles and techniques of emergency care in ambulance operation, with emphasis on development of skills. Attention is given to the emergency care of pulmonary depression and cardiac arrest, bleeding and shock, acute medical and psychiatric problems, wounds, burns, and environmental injuries. Includes training in sterile techniques. Students who successfully complete the course are eligible for the certification test prepared by the Indiana Emergency Medical Services Commission.

### **3221 Basic Cardiology 4**

Presents fundamentals of the cardiology system. Includes instruction in cardiophysiology, pathology, electrocardiography, and principles of cardiac monitoring.

### **3410 Catering 4**

Guides the novice or established caterer in starting or improving a business.

### **3411 Culinary Arts 2**

Surveys the history and development of the food service and hospitality industry.

### **3413 Introduction to Foods 2**

Surveys the food products used in the food service and hospitality industry.

### **3414 Volume Food Service 3**

Outlines the steps required to maintain quality and deliver a completed meal quickly and efficiently to a customer. Instructs in various types of table setups and service, including American, French, and Russian. Emphasizes waiter training; busing, cleaning, and resetting of dining room; kitchen cleanup; dishwashing and sanitation; and proper storage of all portable equipment.

### **3415 Baking Fundamentals 3**

Introduces the science and technology of baking, with emphasis on ingredients and preparation.



- 3416 Culinary Theory and Skills Development** **3**  
Presents concepts, skills, and techniques of basic cookery.
- 3417 Pantry and Breakfast Cookery** **2**  
Presents the fundamentals of pantry, garde-manger, and breakfast cookery.
- 3419 Culinary Arts Externship 1** **3**  
Offers nine hours per week of work experience in commercial food establishments.
- 3421 Nutrition** **3**  
Explores the relationship of food and nutrition to optimal physical fitness. Studies the individual daily needs for protein, vitamins, and minerals, and the food sources that supply them.
- 3422 Volume Food Preparation** **5**  
Introduces methods of preparing foods in volume for large feeding operations. Includes equations for raising or lowering recipes, mathematics used to determine portion costs and profitable selling price, the preparation of volume foods, methods of retaining quality in prepared foods until dispersion, timing to make products ready for immediate service, and menu limitations in volume food service.
- 3423 Introductory Hot Food Preparation** **3**  
Presents concepts and techniques of food preparation, with emphasis on basic menu items.
- 3425 Table Service** **2**  
Introduces dining room service and supervision, including equipment, personnel, responsibilities, organization, customer relations, and table service.
- 3426 Purchasing, Storeroom Procedures, and Stewarding** **2**  
Demonstrates how to staff a storeroom and how to receive, store, and issue merchandise. Emphasis is placed on control and reporting procedures.
- 3427 Institutional Food Service Systems** **2**  
Provides training in the operation of a fast food facility. Emphasis is placed on timing, cooking to order, portion control, management, and supervision.
- 3428 Intermediate Hot Food Preparation** **2**  
Studies concepts and techniques of hot food preparation. Develops culinary skills through daily production.
- 3429 Culinary Arts Externship 2** **3**  
Offers nine hours of work experience per week in commercial food establishments.

- 3430 Meat Cutting/Kitchen** **3**  
Offers an advanced kitchen program in garde-manger techniques, including aspic pates, chaud-froid, terrines, gelatines and sauces, and manipulation of tools. Also covers buffet table arrangement and organization and the use of meat cutting tools.
- 3431 Supervisory Development** **2**  
Provides training in the basic skills and responsibilities of a supervisor.
- 3436 Advanced Baking/Classical Pastry** **3**  
Provides further study in the science and technology of baking, with emphasis on cake decorating and classical desserts.
- 3437 Wines and Spirits** **2**  
Examines beverage control in food service establishments, with attention to purchasing, receiving, storing, and issuing procedures.
- 3438 Menu and Facilities Planning** **2**  
Studies principles and concepts of menu planning, including menu formats and layouts.
- 3439 Culinary Arts Externship 3** **3**  
Includes nine hours of work experience per week in commercial food service establishments.
- 3440 International Food Preparation** **3**  
Instructs in the preparation of menus representative of different countries and cultures. Emphasizes Middle Eastern, Spanish, South American, German, Austrian, Swiss, Scandinavian, Belgian, and Dutch. Also introduces Chinese, Japanese, and Polynesian recipes. Attention given to utensils associated with these cuisines, including the wok, Chinese cleaver, smoke cabinet, Swedish pancake skillet, paella pan, and tortilla press. Discusses and utilizes ingredients and procedures unique to each menu.
- 3442 Buffet Catering** **2**  
Studies cold food preparation and presentation techniques, including charcuterie, specialty canapes, hors d'oeuvres, appetizers, pates, galantines, chaud-froids, terrines, tallow and ice carving, aspics, mousses, cold sauces, vegetable carving, food decoration. Also covers food materials utilization, buffet planning, layout, equipment, zoning, and services.
- 3444 Introduction to Food Service** **3**  
Presents the history of various cuisines, the contributions of leading culinarians, types of food service establishments and their organizational structures, and future trends. Provides a background for further studies in food service.
- 3446 Food and Beverage Service** **3**  
Studies types of dining service appropriate for coffee shops, dining rooms, banquets, and buffets. Covers liquor laws and the service of legal beverages.

### **3449 Food Specialties 3 - Garde-Manger 2** **3**

Studies advanced garde-manger techniques, including aspic pates, chaud-froid, terrines, gelatines, and sauces, and the manipulation of tools. Also covers buffet table arrangement and organization.

### **3451 Introduction to Food Service** **3**

Presents the history of various cuisines, the contributions of leading culinarians, types of food service establishments and their organizational structures, and future trends in the food service industry. Provides a background for further studies in food service.

### **3452 Food Service 1** **3**

Studies fundamentals of food preparation, service procedures and sanitation, and safety practices pertaining to food service. Attention is given to management functions and controls.

### **3454 Foods Service Specialty - Baking** **3**

Introduces the preparation and use of yeast in breadmaking and pastries. Includes baking of pies, cakes, and tarts; the use of equipment, and sanitation practices.

### **3455 Menu Design** **4**

Plans menus to meet the requirements of various types of food service operations for different numbers of people. Includes principles and practices of pricing, ordering, conversion of recipes from small to large quantities, types of menus, public food preferences, and principles of nutrition.

### **3456 Food Service Specialties 2 - Garde-Manger** **3**

Studies special garde-manger techniques, including ice and tallow sculpturing, with emphasis on manipulation of tools. Students will also create buffet showpieces, such as watermelon baskets and table arrangements of fresh fruits and vegetables. Includes introduction to the art of pulled sugar.

### **3457 Purchasing Procedures** **3**

Studies principles and practices pertaining to the purchase of food, supplies, and equipment for hotels, motels, and restaurant operations. Emphasizes testing and evaluation techniques and storeroom controls.

### **3459 Classical Cuisine and Banquet Organization 1** **3**

Presents advanced and sophisticated classical culinary methods, following the principles and techniques of Escoffier. Studies cooking techniques, timing, presentation, history, and terms relevant to classical foods and menus, with emphasis on French cuisine. Offers practical experience in table service operation, emphasizing kitchen coordination and timing. Covers legal considerations, sales planning, menu layout, floor plans, ceremonial functions (weddings, etc.), and off- and on-premise catering. Attention is given also to kosher catering. Students will plan, prepare, and serve a graduation dinner.

- 3460 Equipment Maintenance 3**  
Covers the identification, operation, and maintenance of commercial and institutional food service equipment. Special attention is given to equipment sanitation and safety.
- 3461 A la Carte Food Preparation and Advanced Table Service 3**  
Includes study and preparation of a la carte menu items. Students follow the traditional European brigade system.
- 3462 Advanced Food Preparation and Banquet Service 3**  
Offers advanced study of haute cuisine preparation and service. Includes a buffet presentation as a course project.
- 3463 Culinary Arts Externship 4 3**  
Provides nine hours per week of work experience in a commercial food establishment.
- 3468 Classical Cuisine and Banquet Organization 2 3**  
Studies in detail the planning and execution of classical menus. Includes menus prepared in instructed labs and lectures and class research on the writings of Escoffier and Careme.
- 3470 Fish and Seafood Preparation 3**  
Explains and demonstrates methods of butchering and the preparation of cold fish, shell fish, and mollusks. Provides opportunities for practice.
- 3474 First Aid/Sanitation 2**  
Provides a foundation in the field of food service sanitation. Topics include food microbiology, sanitation procedures, food protection principles, restaurant design, pest control, health inspection procedures, public health law, and first aid.
- 3480 Culinary Arts Externship 1 5**  
Offers apprenticed cooks thirty hours per week of work experience in local restaurants. Provides opportunity for students to demonstrate their abilities and their understanding of safe and orderly kitchen operation.
- 3481 Culinary Arts Externship 2 5**  
Offers apprenticed cooks thirty hours per week of work experience in local restaurants. Teaches the student to select, prepare, and present assorted foods and to estimate the costs of food and labor.
- 3482 Culinary Arts Externship 3 5**  
Offers apprenticed cooks thirty hours per week of work experience in local restaurants. Provides instruction in types of foods for different occasions.
- 3483 Culinary Arts Externship 4 5**  
Offers apprenticed cooks thirty hours per week of work experience in local restaurants.

rants. Teaches the student the uses and preparation of cold meat plates and salads and hot sauces, gravies, and soups.

**3484 Culinary Arts Externship 5** **5**

Offers apprenticed cooks thirty hours per week of work experience in local restaurants. Emphasis is placed on the aesthetic uses, arrangement, and apportionment of garnishments, canapes, and hors d'oeuvres.

**3485 Culinary Arts Externship 6** **5**

Offers apprenticed cooks thirty hours per week of work experience in local restaurants. Emphasis is placed on the preparation of fried foods and the techniques of frying.

**3486 Culinary Arts Externship 7** **5**

Offers apprenticed cooks thirty hours per week of work experience in local restaurants. Emphasis is placed on the broiling of meats, fish, shellfish, and fowl.

**3487 Culinary Arts Externship 8** **5**

Offers apprenticed cooks thirty hours per week of work experience in local restaurants. Attention is given to the preparation, seasoning, and apportionment of various kinds of rice and pasta.

**3607 Nutrition and Diet Therapy** **5**

Provides instruction in the fundamentals of nutrition, therapeutic diets, and the planning and writing of menus.

**3608 Dietary Management 1** **5**

Includes specifications, storage, purchasing, emergency feeding, sanitation, and safety. Course designed for food service employees or prospective employees of health care institutions.

**3609 Dietary Management 2** **5**

Provides further study of dietary specifications and food storage, purchase, and preparation. Also includes recipe standardization, kitchen designs, and delivery systems. Course designed for food service employees or prospective employees of health care institutions.

**3612 Nutrition and Diet Therapy - Fracticum** **1**

Provides instruction in writing general menus and in the therapeutic modification of general diets. Students attend patient care conferences and write the dietary section of patient care plans.

**3712 Medical Office Procedures - Clinical 1** **4-6**

Enables the student to prepare patients for routine examinations in a physician's office. Demonstrates how to assist with physical examinations, take and record vital signs, maintain and prepare sterile equipment, and order supplies. Also covers principles of nutrition.

**3713 Medical Office Bookkeeping 4**

Introduces principles of bookkeeping, with emphasis on the needs of the medical office. Includes debit and credit, double entry bookkeeping, use of journals (particularly combined cost journals), and transaction analysis.

**3719 Medical Typewriting 3**

Focuses on typewriting skills for the medical field, with emphasis on medical forms, articles, case histories, and correspondence. Includes study of medical terminology.

**3721 Medical Office Procedures - Administrative 4**

Covers secretarial, receptionist, housekeeping, and managerial duties and responsibilities pertaining to medical offices and health care agencies. Includes records management; handling of mail; scheduling and telephoning; inventory procedures; financial administration; contact procedures with vendors, patients, hospitals, and professional agencies; and responsibilities in the physician's absence.

**3722 Medical Typewriting 1 3**

Develops skills in production typing of letters, forms, manuscripts, and tabulations. Emphasis is placed on building speed in typing medical letters and case histories, utilizing medical terms.

**3724 Medical Linguistics 1 2**

Teaches meanings of medical terms through study of the Greek and Latin prefixes, suffixes, roots, and combining forms. Emphasis is placed on spelling and use of the medical dictionary. Discusses the ethics of medicine and professional conduct.

**3726 Medical Typewriting 2 4**

Emphasizes the development of speed and accuracy.

**3729 Medical Assistant Clinical Externship 4**

Provides opportunities to perform clinical procedures under supervision in selected physicians' offices, clinics, and hospitals. Includes weekly seminars to discuss students' learning experiences and situations.

**3730 Medical Assistant Laboratory Techniques 4**

Instructs students in the performance of lab procedures, including the preparation of patients and the collection and preparation of specimens. Familiarizes the student with test purposes, results, and norms.

**3732 Medical Office Communications 4**

Develops communications skills required in the medical office. Emphasis is placed on human relations.

**3733 Medical Typewriting 2 2-3**

Emphasizes the development of speed and accuracy.

### **3741 Medical Office Clinical Procedures 2** **6**

Offers lectures and laboratory work in clinical procedures, including administration of therapeutic agents, assistance in minor surgery, cardiopulmonary resuscitation, physical therapy, nutrition, and instruction of patients for diagnostic procedures.

### **3742 Medical Office Procedures - Clinical 2** **4-6**

Provides further instruction in the preparation of patients for routine examinations in a physician's office. Includes assistance with physical examinations, taking and recording vital signs, maintenance and preparation of sterile equipment, and ordering supplies. Attention given also to principles of nutrition.

### **3743 Machine Transcription - Medical 1** **3**

Presents fundamentals of medical dictation and machine transcription. Includes typing of medical reports, study of medical terms, and practice in medical correspondence.

### **3744 Machine Transcription - Medical 2** **3**

Presents advanced medical dictation and machine transcription. Develops proficiency in the use of medical terminology and the typing of medical materials.

### **3752 Medical Office Procedures - Clinical 3** **4-6**

Emphasizes principles and practices pertaining to the medical office. Includes diagnostic procedures, mathematics for office practice and pharmacology, and care of stock medications, drug samples, and instruments. Instructs also in therapeutic diets.

### **3753 Drugs and Solutions** **2**

Introduces hygiene students to the fundamentals of pharmaceutical preparations used in the medical office. Covers chemical properties, dosages, methods of administration, and therapeutic uses.

### **3761 Community Health** **2**

Studies health service in the community. Discusses the institutional components of health care systems, preventive services, and financing of health care and manpower. Explores the issues of quality environment, including pollution and population control, and public policy with regard to research planning and health problems.

### **3763 Medical Office Management** **3**

Trains the student in the organization and management of a physician's office. Offers in-depth study of government health insurance coverage.

### **3765 Medical Insurance** **2**

Familiarizes the student with private, group, and government insurance programs. Develops skills in handling required medical insurance forms, such as hospital/medical-surgical, workmen's compensation, liability, loss of time (sick benefits), Medicare, Medicaid, CHAMPUS, and Blue Cross/Blue Shield.

- 3766 First Aid and Emergency Care** **3**  
 Trains the student to recognize emergency situations, to take an appropriate course of action, and to apply first aid.
- 3768 Comprehensive Certification Review** **3**  
 Offers preparatory study for the certification examination.
- 3769 Medical Assistant Administrative Externship** **4**  
 Offers supervised work experience in the performance of various administrative procedures.
- 3771 Medical Insurance** **3**  
 Presents an overview of medical insurance programs. Develops skills in handling medical insurance forms and reports.
- 4005 Motivation and Learning** **4**  
 Studies theories of motivation and learning and their applications in human interactions. Particular attention is given to the roles of paraprofessionals employed in human service settings.
- 4010 Human Services 1** **4**  
 Covers the history, philosophy, and development of human services and identifies and analyzes the primary services available in urban and rural America. Acquaints the student with the major human service agencies and institutions in the local area. Surveys the paraprofessional careers available in various areas of human service work.
- 4020 Human Services 2** **3**  
 Studies the major client groups with which the paraprofessional works. Includes analysis of individual and situational problems, methods of client-training and assistance, and field visits to agencies.
- 4022 Drugs and Alcohol** **4**  
 Examines problem drinking and drug abuse. Attention is given to theories of alcoholism, identification of signs and symptoms, and information on treatment sources.
- 4023 Problems of Alcohol and Drug Addiction** **4**  
 Offers an approach to the assessment and treatment of alcohol and drug addiction, with emphasis on treatment. Attention is given also to theories of alcoholism and drug abuse as disease.
- 4024 The Physiological Effects of Alcohol and Drugs** **4**  
 Investigates the effects of alcohol and other drugs on the body.
- 4025 Group Leadership and Group Process** **4**  
 Introduces the dynamics of group interaction and leadership. Examines problems of communications, effective emotional responses, and personal growth. Emphasizes the group process as a method of changing behavior.



**4026 Family Counseling Approaches to Alcohol Problems/Drug Abuse 4**

Examines the dynamics of the alcoholic family and explores practice strategies for the worker who counsels the family.

**4027 Intervention and Referral Techniques 4**

Studies techniques used for beginning and crisis counseling, intake interviewing, and referral. Special attention is given to the process of intervention and to the admission and recording of information concerning alcohol and drug abuse clients.

**4032 Helping Relationship Techniques 4**

Develops skills in client-worker relationships. Instructs in what to do before, during, and after an interview or counseling session.

**4034 Interviewing and Counseling 4**

Develops skills in client-worker relationships through practice.

**4041 Directed Practice 1 6**

Offers supervised participation in appropriate agencies.

**4043 Activity Therapy with Special Populations 4**

Surveys craft media and activities. Plans, organizes, selects materials and supplies, and directs craft projects. Emphasis is placed on the adaptation of activities to the special needs of various client groups.

**4050 Group Process and Skills 4**

Introduces the study of group theory and process. Examines the membership and leadership of different types of groups, with emphasis on process. Attention is given to personal and social values, to the roles and effects of groups within the larger society, and to goals and strategies leading to social change.

**4051 Directed Practice 2 4**

Provides an opportunity for the student to gain experience and apply acquired values, concepts, and skills in work at an agency.

**4052 Psychology of Aging and Death 4**

Studies the developmental processes of adulthood, with special emphasis on aging and death.

**4053 Physiology of Aging 4**

Studies the changing physiological functions of the human body in response to aging. Attention is given also to the interrelationships of the body's systems.

**4054 Recreational Programming for the Elderly 4**

Teaches the student how to design and implement programs of recreational activities suited to the needs of the elderly.

**4060 Program Planning and Evaluation****4**

Instructs in the planning and evaluation of human service programs. Deals specifically with problems involved in the transformation of policy goals into human service delivery systems. Covers program funding, cash management, human resources, accountability, and community relations.

**4061 Directed Practice 3****4**

Provides further opportunity for the student to gain experience and apply acquired values, concepts, and skills in work at an agency.

**4065 Human Services Topical Seminar****4**

Discusses current issues of concern to workers in the human services field. Topics are selected according to students' interests.

**4201 Surgical Concepts****2**

Presents selected basic nursing procedures and performance skills. Relates aseptic concepts and techniques to the special needs of the operating room. Covers pre-operative and postoperative care of the patient.

**4211 Surgical Techniques 1****10**

Applies the principles of sterile technique to the preoperative, operative, and post-operative care of the patient. Includes orientation to an ideal situation, patient positioning and transportation, concepts of anesthesiology, techniques of handling drapes, care of contaminated cases, attention to explosion hazards, prevention of infections, processing and preparation of nondisposable items, sterilization, instrument identification, suture and needle use, care of surgical specimens, record-keeping, surgical preps, and hand-scrubbing, gowning, and gloving procedures.

**4221 Surgical Procedures 1****5**

Studies the basic surgical procedures relating to all physiological aspects of surgical interaction, including review of total patient care, diagnostic tests, and immediate postoperative care. Provides concepts of the anatomy involved, existing pathology, and surgical hazards encountered.

**4222 Clinical Applications 1****8**

Applies principles and concepts learned in the classroom to clinical situations.

**4230 Surgical Procedures 2****5**

Studies advanced and specialized surgical procedures relating to all physiological aspects of surgical interaction. Focuses on a concept of the involved anatomy, existing pathology, surgical hazards encountered, surgical procedures, and review of total patient cases.

**4231 Clinical Applications 2****10**

Provides further opportunity to apply principles and concepts learned in the classroom to clinical situations.

- 4232 Obstetrical Techniques 3**  
Examines the anatomical, physiological, and psychological effects of pregnancy on the obstetric patient. Provides opportunities for the operating room technician student to function in the obstetrical unit and in the operating room.
- 4240 Clinical Applications 3 10**  
Provides further opportunity to apply principles and concepts learned in the classroom to clinical situations.
- 4241 Emergency Room Techniques 2**  
Examines the psychological and physiological effects of trauma on the emergency patient. Provides knowledge of emergency conditions and procedures and examines the human capacity to function under adverse conditions.
- 4242 Surgical Procedures 3 4**  
Studies specialized procedures in neurosurgery, cardiovascular surgery and chest surgery. Emphasizes pertinent anatomy and pathology, diagnostic tests, and immediate postoperative care.
- 4244 Operating Room Medical Terminology 2**  
Reviews medical terminology pertinent to the operating room as it relates to the administration of therapeutic agents and the initiation of therapeutic action.
- 4245 Clinical Orientation 1**  
Introduces the student to the job skills needed by the surgical technologist through observation of surgical procedures in the clinicals associated with the program.
- 4401 Foundations of Nursing 3**  
Introduces the principles of nursing, the hospital environment, patient safety, personal hygiene, and principles and applications of body mechanics. Attention is given to the role of nursing hospitalized patients.
- 4402 Collecting, Reporting, and Recording Patient Data 3**  
Studies principles of communications, assisting with physical examinations, measuring vital signs, and reporting and recording pertinent information in correct medical terms.
- 4403 Therapeutic Measures 6**  
Studies the regulation of food and fluid intake and elimination and demonstrates how to perform simple analysis of specimens. Includes the writing of nursing care plans in non-complex situations, principles of medical and surgical asepsis, preoperative and postoperative care, and the administration of therapeutic agents.
- 4406 Holistic Approach to Health 2**  
Reviews theories concerning the relatedness of body, mind, and spirit. Examines the interrelated roles of the clergy, nursing, and other health disciplines in health care.

**4407 Nutrition****2**

Introduces principles of nutrition and diet therapy diets for various age groups. Gives attention to socioeconomic, ethnic, and religious food preferences.

**4408 Oncologic Nursing****1**

Includes the classification of neoplastic disorders, etiology, diagnostic procedures, current modes of therapy, and nursing intervention.

**4409 Basic Science for Practical Nursing 1****4**

Presents introductory lectures on the general body plan, relationships between microorganisms and disease conditions, symptoms, diagnostic tests, and nursing measures and medical terminology pertaining to the integumentary, musculoskeletal, cardiovascular, and digestive systems and to the body as a whole.

**4410 Basic Science for Practical Nursing 2****4**

Presents introductory lectures on the relationships between microorganisms and disease conditions, symptoms, diagnostic tests, and nursing measures and terminology pertaining to special senses and the nervous, respiratory, reproductive, urinary, and endocrine systems.

**4411 Nursing Techniques and Care 1—Prerequisite: Admission to the Practical Nursing Program****3**

Focuses, in lecture and laboratory, on principles that guide nursing action, identification of equipment and supplies that complete a patient's unit, preparation of a patient unit using good body mechanics, protective measures for patients, and components of personal hygiene.

**4412 Endocrine Nursing****2**

Studies deviations from normal function as described by diagnostic testing, symptomatology, and corresponding nursing action. Includes group planning of holistic nursing care; information concerning supportive community agencies; nursing responsibilities for medical orders, drugs, and diet therapy; discussion of nursing action for rehabilitation and psychological adjustment; and modes of teaching the patient responsibility for healthful living. Discusses preventive and first aid measures and both medical and surgical aspects of common generic disorders.

**4415 Cardiovascular Nursing****2**

Studies deviations from normal function as described by diagnostic testing, symptomatology, and corresponding nursing action. Includes group planning of holistic nursing care; information concerning supportive community agencies; nursing responsibilities for medical orders, drugs, and diet therapy; discussion of nursing action for rehabilitation and psychological adjustment; and modes of teaching the patient responsibility for healthful living. Discusses preventive and first aid measures and both medical and surgical aspects of common generic disorders.



#### **4416 Gastrointestinal Nursing**

2

Studies deviations from normal function as described by diagnostic testing, symptomatology, and corresponding nursing action. Includes group planning of holistic nursing care; information concerning supportive community agencies; nursing responsibilities for medical orders, drugs, and diet therapy; discussion of nursing action for rehabilitation and psychological adjustment; and modes of teaching the patient responsibility for healthful living. Discusses preventive and first aid measures and both medical and surgical aspects of common generic disorders.

#### **4419 Respiratory Nursing**

2

Studies deviations from normal function as described by diagnostic testing, symptomatology, and corresponding nursing action. Includes group planning of holistic nursing care; information concerning supportive community agencies; nursing responsibilities for medical orders, drugs, and diet therapy; discussion of nursing action for rehabilitation and psychological adjustment; and modes of teaching the patient responsibility for healthful living. Discusses preventive and first aid measures and both medical and surgical aspects of common generic disorders.

#### **4420 Nursing Techniques and Care 2**

3

Introduces in lecture and laboratory the essentials of good communication and methods of assisting in physical examinations. Attention is given to correct procedures in measuring temperature, pulse, respiration, and blood pressure, and to reporting and recording pertinent information in medical terms. Emphasis is placed on reporting abnormal findings to the R.N. and/or team leader.

#### **4421 Medical-Surgical Nursing 1**

4

Lectures on the nursing care of adults. Includes study of etiology, pathophysiology, symptoms, diagnostic tests, and nursing measures for specific disease states and the prevention of illness. Also discusses the management of disease through use of therapeutic agents and pre- and post-operative care of surgical patients, diabetics, and patients with cardiovascular conditions.

#### **4422 Nutrition and Diet Therapy**

2

Presents introductory lectures on the principles of nutrition and diet therapy. Dis-

cusses dietary allowances for various age groups, with attention to socioeconomic, ethnic, and religious food preferences.

#### **4423 Medical-Surgical Clinical Nursing 1 7**

Offers clinical experience, with emphasis on the nursing process. Provides opportunity to implement nursing skills as correlated with medical-surgical theory pertaining to the care of the adult patient.

#### **4425 Musculoskeletal and Neurological Nursing 2**

Studies deviations from normal function as described by diagnostic testing, symptomatology, and corresponding nursing action. Includes group planning of holistic nursing care; information concerning supportive community agencies; nursing responsibilities for medical orders, drugs, and diet therapy; discussion of nursing action for rehabilitation and psychological adjustment; and modes of teaching the patient responsibility for healthful living. Discusses preventive and first aid measures and both medical and surgical aspects of common generic disorders.

#### **4426 Genitourinary Nursing 2**

Studies deviations from normal function as described by diagnostic testing, symptomatology, and corresponding nursing action. Includes group planning of holistic nursing care; information concerning supportive community agencies; nursing responsibilities for medical orders, drugs, and diet therapy; discussion of nursing action for rehabilitation and psychological adjustment; and modes of teaching the patient responsibility for healthful living. Discusses preventive and first aid measures and both medical and surgical aspects of common generic disorders.

#### **4430 Nursing Techniques and Care 3**

Offers lectures and laboratory training dealing with the regulation of food and fluid intake and elimination from the GU and GI tract. Students are taught to perform simple analyses on specimens from the GU and GI tract. Emphasis is placed on the importance of reporting abnormal findings to the R.N. Introduces the writing of nursing care plans in non-complex situations.

#### **4431 Medical-Surgical Nursing 2 4**

Presents lectures on the nursing care of adults. Includes etiology, pathophysiology, symptoms, diagnostic tests, nursing measures for specific disease conditions, preventive measures, and management of disease through the use of therapeutic agents. Discusses conditions related to gastrointestinal, thyroid gland, and pulmonary functions.

#### **4432 Medical-Surgical Clinical Nursing 2 7**

Provides further opportunities to implement nursing skills as correlated to medical-surgical theory pertaining to the care of the adult patient. Emphasis is placed on nursing process and drug administration.

#### **4434 Intravenous Therapy 2**

Presents concepts of fluid, electrolyte, and acid base balance as applied to total parenteral nutrition and therapy.

- 4437 Dermatologic and E.E.N.T. Nursing** 1
- Studies deviations from normal function as described by diagnostic testing, symptomatology, and corresponding nursing action. Includes group planning of holistic nursing care; information concerning supportive community agencies; nursing responsibilities for medical orders, drugs, and diet therapy; discussion of nursing action for rehabilitation and psychological adjustment, and modes of teaching the patient responsibility for healthful living. Discusses preventive and first aid measures and both medical and surgical aspects of common generic disorders.
- 4438 Gerontology** 2
- Studies the processes of normal aging, with emphasis on the increasing psychological, emotional, recreational, and activity needs of the elderly.
- 4439 Geriatric Clinical Nursing** 3
- Introduces geriatric care outside the hospital environment. Includes nursing care, activities, and recreation for the older adult.
- 4440 Maternal Health Nursing** 3
- Instructs in the needs and care of the mother and infant. Studies the maternity cycle, the growth and development of newborns, and appropriate nursing intervention.
- 4442 Maternal Clinical Nursing** 4
- Offers experience in maternal nursing, including care for mothers in labor and delivery, work on the postpartal unit, and care for the newborn. Emphasis is placed on the nursing process.
- 4443 Nursing Techniques and Care** 4
- Offers introductory lectures and laboratory training in techniques of administering therapeutic agents. Discusses the initiation of therapeutic action and the role of the LPN and the R.N. in the administration of therapeutic agents.
- 4444 Medical-Surgical Nursing** 3
- Lectures on the nursing care of adults. Includes study of etiology, pathophysiology, symptoms, diagnostic tests, nursing measures to prevent illness, management of disease through use of therapeutic agents, and conditions related to musculoskeletal, urinary, and reproductive functions.
- 4445 Medical-Surgical Clinical Nursing** 3
- Offers medical-surgical clinical training, emphasizing the care of patients with impaired musculoskeletal, urinary, and reproductive functions. Introduces the use of therapeutic diets in the treatment of illness.
- 4446 Community Health Resources** 2
- Explores community health concerns and agencies. Includes guest lectures and field trips to community agencies.

**4449 Practical Nurse in Today's Society****2**

Surveys the history of nursing, nursing organizations, continuing education, legal aspects of nursing, licensure, and employment. Examines moral and ethical issues raised by modern technology.

**4450 Nursing Techniques and Care 5****3**

Offers lectures and laboratory training in identifying the physical, emotional, and spiritual needs of aging, long-term, and chronically and terminally ill patients. Discusses the role of the clergyman and religious practices pertaining to health care. Introduces techniques used to prevent the spread of communicable disease.

**4453 Pediatric Nursing****3**

Studies growth and development from infancy through adolescence. Includes congenital anomalies, and pathophysiology, with appropriate nursing intervention.

**4454 Pediatric Clinical Nursing****3**

Provides opportunity to implement nursing skills in the care of the pediatric patient. Emphasis is placed on human growth and development and the nursing process.

**4460 Pharmacology 1****2**

Studies the fluids used in intravenous therapy, antibiotics, analgesics, sedatives, hypnotics, and emergency drugs. Attention is given to drug action and reaction, correct dosage, and methods of administration.

**4501 Life Cycle Nursing 1: Early Life****8**

Identifies, in lecture and discussion, the roles of the A.D. nurse in meeting the needs of individuals in early life and those of their families. Utilizes the nursing process to assess health care problems related to life's beginning. Analyzes therapeutic measures appropriate in providing quality maternal and pediatric care, and encourages practices that promote health and prevent illness throughout life.

**4502 Life Cycle Nursing Clinical Practicum 1: Early Life****5**

Provides opportunity in the clinical setting to demonstrate the roles of the A.D. nurse and the nursing process in providing care for individuals in early life and for their families in maternity and pediatric areas. Also provides opportunity for assessing unmet needs, implementing therapeutic measures, and teaching and encouraging practices to promote optimal health and prevention of illness throughout life.

**4503 Life Cycle Nursing 2: Middle Life****8**

Examines, in lecture and discussion, the roles of the A.D. nurse, utilizing the nursing process to meet the needs of individuals in middle life suffering acute physical illness and/or maladaptive psychosocial behavior. Identifies ways in which unmet needs contribute to acute health problems and adjustments in lifestyle necessitated by illness. Analyzes methods of nursing care using effective and appropriate communication and astute cognitive, psychomotor, and effective skills based on scientific principles.



**4504 Life Cycle Nursing Clinical Practicum 2: Middle Life****5**

Provides clinical experience designed to implement the roles of the A.D. nurse in caring for middle age patients suffering acute physical illness and/or maladaptive psychosocial behavior. Utilizes nursing skills based on identified scientific facts, concepts, and principles. Requires cognitive, and psychomotor capabilities, refined decision-making skills, and appropriate therapeutic communication in the management of patient care and the teaching of patients and their families.

**4505 Life Cycle Nursing 3: Later Life****8**

Analyzes, in lecture and discussion, the full use of the nursing process to address the needs of the elderly and their families, including the chronically ill and those with multiple problems, in adapting to aging and death. Emphasis is placed on problem solving, collaboration with other members of the health care team, beginning management principles, patient advocacy, responsibility, professional growth, self-fulfillment, and evaluation of therapeutic measures involving astute judgement and sensitivity in providing care.

**4506 Life Cycle Nursing Clinical Practicum 3: Later Life****5**

Provides clinical opportunities to develop effectiveness in fulfilling the roles of the A.D. nurse in caring for patients in later life and their families in adapting to aging and death. Includes care of the chronically ill and those with multiple problems. Offers opportunities to demonstrate safe performance of appropriate therapeutic measures based on broad principles of scientific and nursing knowledge. Requires acute judgement and sensitivity and the ability to direct others in selected aspects of care. Includes evaluation of the total nursing process.

**4507 Issues in Nursing****2**

Examines issues in nursing practice through lecture and discussion. Attention is given to the responsibility of nursing to meet changing needs in today's environment, the interrelated roles of the A.D. nurse, patient advocacy, prevention of illness, provision of quality health care—historical and current, developments in the health care field, future trends, improvement of nursing practice, legal considerations, personal and professional growth, and needs of the individual nurse in seeking employment.

**4609 Nursing Procedures for X-ray Technicians****2**

Studies basic nursing care as provided by the radiologic technologist. Covers patient-technician relationships, principles of asepsis, isolation, and first aid.

**4613 Radiation Physics 1****3**

Introduces physics as utilized in the production of X-rays. Includes physical laws pertaining to atomic structure, chemical properties and reactions, and electrical circuitry. Also studies equipment and methods of generation and measurement of electricity.

**4620 Orientation to X-ray Technology****4**

Discusses the historical development of X-ray technology and the role and function of the radiologic technologist. Studies principles of the X-ray tube, properties of radiation, film-processing equipment, intensifying screens, terminology, and introduc-

tory techniques of positioning the chest and abdomen. Emphasizes procedures and practices of radiation protection.

#### **4623 X-ray Clinical Education 1 5**

Implements Clinical Category 1 of the Competency Model. Includes laboratory demonstration and clinical practice.

#### **4624 Radiographic Positioning 1 3**

Correlates positioning terminology and techniques and film evaluation with Clinical Category 1. Demonstrates upper extremity, intravenous pyelogram, and gall-bladder examinations.

#### **4625 Radiographic Exposures 1 3**

Presents film construction, sensitometry, and processing techniques. Emphasizes the definition and effect of prime radiography factors related to the formulation of exposures.

#### **4633 Radiographic Positioning 2 2**

Correlates positioning terminology and techniques and film evaluation to Clinical Category 2. Includes study of lower extremity, upper GI, esophagus, small bowel, and cardiac fluoroscopy.

#### **4634 Radiographic Exposures 2 3**

Demonstrates, by means of problem-solving exercises, conversion factors affecting the elements of radiographic quality. Includes pediatric techniques, calibration, heat unit determination, and technique chart construction.

#### **4638 X-ray Clinical Education 2 6**

Tests the student's competency skills in Category 1, and introduces Category 2 of the Competency Model laboratory testing. Includes supervised clinical experience.

#### **4642 Imaging Techniques 3**

Presents theories, principles, and demonstrations of current image modalities, including the image intensifier, tomography, video and cine camera, serial changers, subtraction technique, polaroid, termography, ultra sound, and xeradiography.

#### **4643 Radiographic Positioning 3 3**

Correlates positioning terminology, techniques, and film evaluation to Clinical Category 3. Includes the vertebral column, bony thorax, colon, cystogram, and IV cholangiogram examinations.

#### **4648 X-ray Clinical Education 3 6**

Introduces Category 3 of the Competency Model laboratory testing, while competency skills over Category 2 are tested. Implements a skill maintenance program and continues clinical application.

- 4650 Radiographic Positioning 4 3**  
Presents positioning terminology, techniques, and film evaluation of Clinical Category 4. Covers the cranium, special skull examinations, and mammography.
- 4655 X-ray Clinical Education 4 6**  
Introduces Category 4 of the Competency Model in laboratory testing, while competency skills over Category 3 are tested. Continues maintenance of skills over previous categories during clinical applications.
- 4661 Special Procedures 3**  
Presents selected studies of the vascular, neurological, reproductive, and other systems, and demonstrates the related equipment and techniques of positioning.
- 4668 X-ray Clinical Education 5 6**  
Completes Category 4 of the Competency Model in laboratory testing. Continues skill development in all previous categories and clinical applications.
- 4672 Radiobiology 3**  
Presents theory and principles of the effects of ionization radiation upon living tissues. Includes a review of dosage measurements, DNA structure and function, and cellular radiosensitivity.
- 4678 X-ray Clinical Education 6 6**  
Completes all category testing. Continues skill development in all categories.
- 4685 General Examination Review 4**  
Reviews contents of program, emphasizing anatomy, physics, exposure principles and positioning. Simulated American Registry tests prepare the student for the certification examination.
- 4688 X-ray Clinical Education 7 6**  
Includes final competency testing for students who have not completed X-ray Clinical Education 6 (4678). Continues skill maintenance over all categories.
- 4699 Radiographic Quality Assurance 3**  
Presents theories and practices pertaining to the establishment of department exposure standards. Includes equipment tests for reliability, problem solving, reject analysis, and cost containment. Offers practical experience in processor monitoring, record-keeping, and radiographic quality control tests.
- 4810 Basic Science 4**  
Presents the fundamentals of chemistry, physics, and mathematics as related to respiratory therapy. Introduces English and metric measuring and symbol systems. Emphasis is placed on general gas laws related to gas transport.
- 4812 Respiratory Therapy Science 1 6**  
Presents a brief history of respiratory therapy, the principles and practices of oxy-

gen administration, humidity and aerosol therapy, and gas analyzers. Emphasis is placed on safety.

**4813 Nursing Techniques****3**

Includes patient needs, asepsis, body mechanics, CPR, vital signs, isolation techniques, medical terminology, and charting.

**4820 Cardiopulmonary Physiology****4**

Studies the cardiopulmonary system. Includes ventilation, perfusion, gas exchange, blood gases and acid base studies, and physiologic monitoring. Emphasis is placed on airway management.

**4821 Respiratory Therapy Science 2****6**

Studies the mechanics of ventilation, IPPB, principles and uses of mechanical respirators, airway management, incentive spirometry, chest physiotherapy, and pulmonary rehabilitation.

**4822 Respiratory Therapy Applications 1****5**

Studies applications of respiratory therapy through direct observation in various clinical areas.

**4823 Clinical Practicum 1****4**

Provides supervised experience in oxygen therapy, CPR, and various respiratory therapy tasks in clinical areas.

**4830 Laboratory Data****3**

Studies techniques for sputum collection, lung function testing, and blood gas analysis.

**4831 Clinical Medicine****4**

Introduces etiology, symptomatology, diagnosis, therapeutics, and prognosis of disease conditions related to respiratory therapy.

- 4832 Respiratory Therapy Applications 2** **5**  
Provides further supervised experience in oxygen therapy, CPR, and various respiratory therapy tasks in clinical areas.
- 4833 Clinical Practicum 2** **8**  
Provides further clinical experience in IPPB, incentive spirometry, chest physical therapy, airway maintenance, and pulmonary functions.
- 4835 Respiratory Therapy Science 3** **6**  
Introduces practices of critical respiratory care of adults and infants. Studies volume and pediatric ventilators and the care of patients receiving mechanical ventilation.
- 4837 Pulmonary Pathophysiology** **4**  
Introduces etiology, symptomatology, diagnosis, therapeutics, and prognosis of disease conditions related to respiratory therapy.
- 4841 Clinical Practicum 3** **13**  
Provides further clinical experience in IPPB, incentive spirometry, chest physical therapy, airway maintenance, and pulmonary functions.
- 4844 Cardiopulmonary Laboratory Diagnosis** **4**  
Introduces the function of the cardiopulmonary laboratory and provides an understanding of basic pulmonary function tests and techniques. Includes blood gas interpretation, electrolytes, sputum collection and study, electrocardiography, and basic cardiac arrhythmias.
- 4845 Seminar** **2**  
Includes preparation and presentation to faculty and peers of in-depth case studies and reports drawn from current literature.
- 4848 Advanced Cardiopulmonary-Renal Physiology** **6**  
Studies the physiology and interrelations of the cardiac, respiratory, and renal systems, with emphasis on advanced analysis, evaluative techniques, and correlation with pathophysiology.
- 4849 Management Techniques for Respiratory Therapy** **3**  
Studies management problems unique to the respiratory therapist. Develops proficiency in laboratory techniques designed to alleviate common problems. Emphasis is placed on supervisory techniques, personal management and budgeting.
- 4850 Therapist Clinic 1** **7**  
Develops proficiency in entrance level clinical skills under supervision at clinical facilities. Includes basic modalities of respiratory therapy and diagnostic and ventilator techniques. (4841 may be substituted for this course.)

**4851 Therapist Clinic 2****12**

Provides supervised advanced clinical experience in respiratory therapy. Includes various specialty rotations.

**4852 Critical Respiratory Care****6**

Develops proficiency in critical-care therapeutic modalities as they apply to neonatal, pediatric, and adult respiratory patients. Special emphasis is placed on evaluation, monitoring, transportation, and management of patients on mechanical ventilation.

## **Applied Science and Technologies**

**5113 Internal Combustion Engines****2**

Presents fundamentals of internal combustion engines, including theory of two- and four-cycle engines, magnets, battery and thermal ignition, carburetors, fuel pumps, and cooling and lubrication systems. Emphasis is placed on preventive maintenance and safety.

**5114 Direct Current Fundamentals****2**

Studies the electrical functions of all three fueled engines. Covers starting, storage, charging, lighting, ignition components, and controlling and protective devices. Emphasis is placed on safety precautions.

**5115 Hydraulic Fundamentals****3**

Studies the physical properties and control of fluids, the multiplication of forces, and the components of valves, pumps, cylinders, conduction, accumulators, and cylinders.

**5116 Tractor Engines****3**

Studies the purposes and components of the flywheel, crankshaft, cam shaft, connecting rod, piston, head-cylinder block, sleeves, water pump, oil lubrication pump, carburetor, fuel pump, distributor drive, governor, and radiator. Compares laboratory diesel and gasoline engines.

**5123 Diesel Engines 1****3**

Studies intake and exhaust systems of agricultural and industrial diesels. Includes fuel delivery systems, theory of thermal ignition, fuel, air and lubrication filtration, and the preventive maintenance required for each component. Also compares laboratory diesel engines with gasoline and L-P engines.

**5124 Manual Transmissions****3**

Studies sliding gear transmissions and related components of the power train, including clutches, differentials, final drives and power take-off mechanisms. Also studies manual steering and brakes and collar-shift and synchromesh transmissions.

**5125 Open Center Hydraulic Systems****3**

Studies hydraulic systems used on older or smaller tractors and machinery. Covers gear and vane-type pumps, spool and rotary valves, flow dividers, relief valves,

single- and double-action cylinders, simple low-horsepower hydraulic motors, preventive maintenance, and safety.

### **5126 Closed Center Hydraulic Systems 3**

Studies radial and axial piston-type pumps, accumulators, stroke-control valves, closed-center rotary and spool valves, and direction, pressure, and volume control valves. Emphasis is placed on preventive maintenance.

### **5127 Hydraulic-Assist Transmissions 3**

Studies the hydraulic components of the main hydraulic supporting systems. Includes hydraulic-assist steering, brakes, clutches, transmissions, differential locks, and power-takeoff mechanisms. Emphasis is placed on preventive maintenance.

### **5128 Electronically Controlled Transmission 3**

Studies the combination of a heavy-duty 6-speed planetary powershift transmission and a 2.30:1 multiplication ratio torque converter. Shifting is done by a microprocessor.

### **5132 Diesel Engines 2 3**

Studies diesel pumps and injectors, including timing and tune-up. Examines functions and purposes of laboratory pumps and nozzles.

### **5133 Environmental Control 4**

Studies the current status of resource preservation, the control of natural resources, and agricultural responsibilities pertaining to soil, water, and air pollution.

### **5134 Parts Department Management 3**

Studies the operation and management of a parts department. Includes inventory control and turnover, profit margins, public relations, and diagnosis of fill rate. Attention is given to emergency orders and management of obsolete parts.

### **5135 Diesel Engines 3 2**

Demonstrates dynamometer loading of a diesel engine to study thermal efficiency with and without a turbocharger. Examines engines fitted with intake and exhaust manifold vacuum-pressure gauges, pyrometers, tachometers, and manometers. Also studies tune-up and use of the dynamometer to meet manufacturer's specifications for original equipment. Emphasis is placed on preventive maintenance.

### **5136 Hydrostatic Transmissions 3**

Studies the components of hydrostatic transmission systems, including variable flow hydrostatic pumps and motors, charge pumps, check valves, crossover relief valves, shuttle valves, swashplates, and servo pistons.

### **5137 Service Department Management 3**

Studies the management and operation of a service department through examination of the practices of successful automotive dealers. Attention is given to recovered labor costs, incentive programs, shop flow schedules, flat rates, shop tickets, merchandising, and customer relations.

**5142 Lawn and Garden Equipment****3**

Studies equipment powered by internal combustion engines of less than 35 horsepower. Includes plows, disks, harrows, rakes, tillers, seeders, fertilizer spreaders, sprayers, standby alternators, irrigation pumps, and mowing equipment. Emphasis is placed on preventive maintenance and safety.

**5144 Crawler Undercarriages****2**

Studies the service requirements for the thirteen main components of a crawler undercarriage. Includes servicing of the track master link and flush and counterbored track links and diagnosis of undercarriage and track alignment. Emphasis is placed on preventive maintenance and safety.

**5145 Farm Machinery 1****3**

Studies primary and secondary soil tillage tools. Includes setup, adjustment, and predelivery performance of plows, disks, harrows, tiller, and multiple purpose tools. Emphasis is placed on operational safety precautions.

**5146 Fuels, Lubricants, and Coolants****3**

Focuses on the fuel requirements and specifications for each of the three fuels used in internal combustion engines. Studies coolant service and requirements, with emphasis on preventive maintenance.

**5147 Bearings and Seals****3**

Focuses on friction and antifriction bearings and dust and liquid seals. Includes installation procedures for each type of bearing and seal, with attention to the proper preload and endplay of bearings. Emphasizes preventive maintenance and installation proficiency.

**5148 Belts and Chains****3**

Studies belt types, load ratings, and installation, with attention to the alignment of belt pulleys and tightness of belts. Covers chain types, sprocket alignment, and chain sag. Emphasizes daily preventive maintenance procedures.

**5149 Tires and Tracks****2**

Studies off-the-road tires, including size, composition codes, service, and maintenance. Provides on-track maintenance instruction for operators, with emphasis on preventive maintenance and safety.

**5154 Farm Machinery 2****3**

Studies the setup, adjustment, predelivery performance, and calibration of the components of planters, drills, and chemical, fertilizer, and cultivation machinery. Emphasizes preventive maintenance and safety.

**5157 Agricultural and Industrial Equipment Sales****2**

Studies sales methods pertaining to new and used equipment. Examines trade-downs, washout sales, scrapping procedures, business costs, pricing, sales incentive and follow-up, equipment auctions and the jockey's role in price determination, and cold canvassing as a means of increasing equipment sales.



## **5158 Diesel Engines 4 2**

Studies the V-8 diesel, including pump injector, single unit supercharger, two-cycle diesel theory, and servicing for the industrial servicemen.

## **5164 Farm Machinery 3 3**

Studies types of harvesting and handling machinery commonly used on local farms. Includes mowers, hay rakes and balers, grain and corn combines, forage harvesters, grain dryers, augers, elevators, and related equipment. Emphasizes operation safety.

## **5170 Farm Machinery 4 3**

Presents the fundamentals of tractor operation, including hitching, preparation, starting and stopping under load, gear selection, speed of field operation, controls, ballast, accessories, implement attachment, and operation under hazardous conditions.

## **5180 Farm Machinery 5 3**

Concentrates on efficiency in farm production. Examines tractor work capacity, machinery production capacity, expected tractor and machinery depreciation, custom work, leasing, ownership, operating costs, and long-range plans for machinery replacement.

## **5183 Hydrostatic Hydraulic Transmissions 3**

Studies high pressure, closed loop, hydraulic power trains without clutches, brakes, or gears. Examines current approaches to torque-variable speed transmission.

## **5184 Torque Converter Transmissions 3**

Studies the coupling of the torque converter and hydraulics-assisted transmission to meet high load requirements at low speed and low load requirements at high speed. Both types of units are used in laboratory assignments.

## **5185 Crop Chemicals Equipment 2**

Studies the calibration of farm chemicals and the machinery used to apply chemicals. Attention is given to environmental factors and safety in using crop chemicals.

## **5186 Welding Practice for Agricultural Equipment 3**

Introduces basic welding procedures and techniques pertaining to agricultural equipment.

## **5187 Identification of Parts Failures 1**

Trains the service technician to identify quickly parts failures and causes of damage.

## **5313 Fire Technology 3**

Examines fire problems and other aspects of the fire technology field. Attention is given to characteristics and behavior of fire and to the hazardous properties of materials.

**5314 Fire Apparatus 1****3**

Studies the use of all types of fire-fighting apparatus, including aerial ladders, pumpers, elevating platforms, hoses, and aircraft fire equipment. Special attention is given to maintenance of equipment and to emergency driving hazards on dry and wet roads.

**5322 Electricity****3**

Introduces basic concepts of electricity for electrical workers. Studies include series and parallel circuits, series-parallel combinations, Ohm's Law, and definitions of electromotive force, current, and resistance.

**5323 Fire Apparatus 2****3**

Includes construction, operation, and maintenance of aerial ladders and platforms and other specialized equipment.

**5324 Fire Department Hydraulics 1****3**

Treats problems related to public water supply and distribution systems, including water mains, hydrants, valves, and fittings. Also demonstrates the use of pumpers to insure adequate supply and pressure.

**5325 Fire Department Hydraulics 2****2**

Offers further study of problems pertaining to public water supply and distribution.

**5332 Fire-Fighting Strategy and Tactics 1****3**

Prepares the student to make responsible decisions concerning fire ground tactics at the battalion or company level. Examines situations frequently encountered by the fire fighter.

**5333 Fire Alarm and Protection Equipment****3**

Presents fundamentals of municipal and local alarm systems. Examines heat, smoke, and flame detectors; telephone and tele-equipment; sprinkler systems; and protective alarm and detection systems.

**5334 Fire-Fighting Strategy and Tactics 2****2**

Provides further training in fire ground tactics at both battalion and company levels. Emphasis is placed on the tactical simulator.

**5342 Hazardous Materials 1****3**

Reviews basic chemistry and introduces storage of hazardous materials, handling laws and standards, and fire fighting practices pertaining to hazardous materials.

**5343 Rescue Practices and Procedures****3**

Demonstrates rescue methods, including fire rescue, auto extraction, and aircraft firefighting and rescue procedures. Outlines in detail the responsibilities of a fire department in protecting evidence at the scene of an aircraft incident.

- 5350 Applied Chemistry** **2**  
 Studies fundamentals of chemistry, including solutions, acids and bases, chemical kinetics, and equilibrium. Introduces organic, bio-, and industrial chemistry.
- 5351 Industrial Safety and Fire Control** **3**  
 Studies the principles of combustion; classes of fire; characteristics of combustibles, explosions, and backdrafts; techniques of fire control; methods of heat transfer; flashpoint burning point; ignition temperature; vapor density; use of tools and equipment; safety procedures; and protective clothing and breathing apparatus.
- 5352 Hazardous Materials 2** **3**  
 Provides further study in the chemistry, storage, and handling of hazardous materials.
- 5353 Fire Investigations** **4**  
 Examines the responsibilities of the fire investigator, with attention to fire cause and loss, collection and preservation of evidence, and investigation of fire origin. Emphasis is placed on the uses and applications of scientific aids to investigation.
- 5360 Fire Service Inspection** **4**  
 Examines functions and methods of fire prevention and inspection. Study includes recognition of hazards, recommendations for corrective action, engineering to solve fire hazards, and enforcement of codes and laws.
- 5361 Fire Service Organization and Management** **4**  
 Presents effective methods of fire service organization and management. Attention is given to fire safety problems and relations with other agencies.
- 5362 Fire Department Specifications** **4**  
 Instructs in the preparation of specifications for fire stations, apparatus, hoses, and other equipment.
- 5363 Fire Prevention** **4**  
 Studies the function and organization of fire prevention. Covers inspection, surveying, and mapping procedures.
- 5364 Legal Problems in Fire Service** **4**  
 Studies law as it relates to the fire fighter, fire officer, and fire investigator. Examines laws pertaining to the organization and operation of fire departments, liability, mutual aid, arson, fire prevention, and building construction. Attention is given to fire scene and courtroom procedures.
- 5370 Fire Fighting 1** **3**  
 Trains the fire fighter in basic skills needed for Second-Class Fire Fighter certification.

- 5372 Fire Fighting 2A** **3**  
Offers the first half of the state-certified skills courses needed for First-Class Fire Fighter certification.
- 5373 Fire Fighting 2B** **3**  
Offers the second half of the state-certified skills courses needed for First-Class Fire Fighter certification.
- 5374 Inspectors Course 1** **3**  
Studies the organization and functions of the Fire Prevention Bureau. Provides training for the inspector in the examination of buildings.
- 5375 Inspectors Course 2** **3**  
Offers further instruction in the organization and functions of the Fire Prevention Bureau, including inspection of buildings.
- 5391 Management Essentials** **4**  
Examines management and employee productivity and satisfaction relating to small fire company work groups. Develops skills in planning, decision making, and control.
- 5393 Building Materials** **3**  
Studies the properties, applications, and costs of materials used in architectural construction.
- 5394 Aircraft Fire Fighting 1** **3**  
Trains fire department personnel in aircraft fire rescue.
- 5395 Aircraft Fire Fighting 2** **3**  
Provides further training in aircraft fire rescue.
- 5396 Ship Board Fire Fighting** **3**  
Studies fire fighting methods for land-based companies. Includes survey of equipment, hookups, procedures, and use of water, foams, and support systems on ships.
- 5397 Radioactive Emergencies** **3**  
Studies radiation hazards, fire fighting procedures for generating plants, transportation of equipment, and emergency situations for fire service and safety people.
- 5421 Architectural Drafting** **3**  
Presents architectural drafting equipment, scale reading, lettering, and isometric, oblique, pictorial, perspective, and free-hand sketching.
- 5422 Residential Construction Materials** **3**  
Studies architectural and structural construction materials used in residential and light commercial buildings, including a study of applications and alternatives.

- 5423 Commercial Construction Materials** **3**  
Studies materials used in commercial and industrial building construction. Attention is given to cost factors.
- 5424 Residential and Commercial Construction Materials** **3**  
Studies materials used in architectural construction. Consideration is given to properties and standard sizes of structural materials and to construction techniques.
- 5430 Light Construction Presentation Drafting** **3**  
Focuses on drawings for residential construction, with attention to size and space relationships.
- 5431 Light Construction Layout Drafting** **3**  
Instructs in the preparation of working drawings, with attention to foundation and floor plans, wall sections and plot plan, climate control, and electrical plans.
- 5432 Mechanical and Electrical Equipment** **3**  
Studies the mechanical and electrical systems within a structure design. Includes plumbing, climate control, and electrical systems as integrated systems.
- 5433 Light Construction Detail Drafting—Prerequisite: 5431** **3**  
Instructs in the preparation of working drawings, with attention to interior elevations, details of windows, doors, and built-in features, and scheduling.
- 5434 Fabrication Drafting** **3**  
Provides experience in electronics construction and assembly, with emphasis on the use and care of shop tools and test equipment. Studies techniques used in diagramming electronic circuits and systems, and develops skills in reading and interpreting diagrams and electronic prints.
- 5440 Medium Construction Presentation Drafting** **3**  
Concentrates on presentation drawings for buildings using masonry units. Studies size and space relationship and codes as the basis of design.
- 5441 Medium Construction Layout Drafting** **3**  
Focuses on the preparation of working drawings, with attention to foundations and floor plans, roof plans, wall sections and plot plans, climate control, plumbing, and electrical systems.
- 5442 Medium Construction Detail Drafting** **3**  
Focuses on the preparation of working drawings, with attention to exterior and interior elevations, details of windows, doors, and built-in features, and scheduling.
- 5443 Electrical Equipment** **3**  
Studies electrical components used in the construction industry. Includes calculation and design of electrical systems, spatial and structural considerations, and the selection of materials.

- 5450 Heavy Construction Presentation Drafting 3**  
 Focuses on presentation drawings for buildings of masonry and steel construction, with attention to size and space relationships and codes as the basis of design.
- 5451 Heavy Construction Layout Drafting 3**  
 Focuses on the preparation of working drawings, with attention to foundations, floor and roof plans, wall sections and plot plans, climate control, plumbing, and electrical systems.
- 5452 Estimating 3**  
 Presents concepts and principles of quantity takeoff of building materials as required by construction contractors. Includes applications in preparing sets of plans.
- 5453 Heavy Construction Detail Drafting 3**  
 Focuses on the preparation of working drawings, with attention to exterior and interior elevations, details of windows, doors, and built-in features, and scheduling.
- 5454 Interactive Computer-Aided Design 5**  
 Demonstrates applications of computer-aided design in industrial drafting. This course challenges the student to apply computer graphics to solve advanced drafting problems.
- 5455 Architectural Computer-Aided Design 3**  
 Develops skill in architectural applications of computer-aided design. Attention is given to the dimensions and geometric elements of architectural design, figure parts, layering and schemes. Students will study an exclusive architectural environment.
- 5456 Computer-Aided Design Fundamentals 3**  
 Introduces computer-aided design system capabilities, command syntax, two dimensional graphic generation, text and basic dimensioning.
- 5457 Three-Dimensional Computer-Aided Design 5**  
 An advanced course in computer graphics which deals with parts structuring, multi-view generation, three dimensional objects, working surfaces, library parts and execute files.
- 5458 Computer-Aided Mapping 3**  
 Demonstrates topographic mapping, plat mapping, grid systems, contour lines, and the calculation of distance and area using a computer-aided drafting system.
- 5459 Computer-Aided Printed Circuit Board Design 3**  
 Instructs in electric schematics, schematic symbols, and printed circuit boards. Offers laboratory experience in using the circuit board.
- 5460 Team Project Presentation Drafting 3**  
 Develops skills in presentation drawings for industrial or residential buildings.

**5461 Team Project Layout Drafting 3**

Focuses on the preparation of working drawings, with attention to foundations, floor and roof plans, wall sections and plot plans, climate control, plumbing, and electrical systems.

**5462 Team Project Detail Drafting 3**

Focuses on the preparation of detailed drawings, with attention to exterior and interior elevation, window and door details and schedules, and built-in features.

**5463 Structural Design and Drafting 3**

Applies theories studied in Statics (7551) and Strength of Materials (7552) to architectural and structural engineering. Studies the design of simple footings, foundation walls, wooden trusses, and steel columns, beams, and roof systems. Also includes design and drawing of structural connections and joints in structural shop drawings.

**5470 Business Presentation Drawing 4**

Supervises the student in completing a set of working drawings for an office building or for light industry. Includes assimilation and computing of data as necessary.

**5471 Surveying Theory 3**

Presents theory and techniques of surveying, including the use and care of the level, transit, and other surveying equipment.

**5472 Surveying Field Problems 2**

Provides class field experience in chaining, running a traverse, running a level circuit, and keeping an accurate field book.

**5473 Architectural Rendering 3**

Presents a survey and history of pictorial drawing. Studies light and color and the rendering of media, with exercises in various techniques and media applications.

**5474 Plat Mapping 3**

Studies land boundary relationships with respect to the common domain system of surveying. Emphasis is given to latitude and to the departure system of drawing layout, the determination of areas, and use of aerial photographs.

**5475 Topographic Map Drafting 3**

Provides experience in topographical surveying, methods of establishing grades, and estimation of quantities required for cuts and fills.

**5476 Business Principles 3**

Presents fundamentals of economics, business, and industry, with emphasis on building construction and architectural design. Includes study of architect-client and architect-contractor relationships and the financial operations of an architectural organization.

- 5477 Model Building** **3**  
 Studies the construction of small-scale, three-dimensional drafting projects. Attention is given to the appearance, function, landscaping, and structural design of customer presentations.
- 5478 Specifications and Codes** **3**  
 Studies contracts and specifications pertaining to plans, buildings, codes, and construction practices. Emphasizes relationships between specifications and working drawings from both legal and practical standpoints.
- 5482 Pipe Drafting 1** **3**  
 Demonstrates drafting methods, pipe supports, pipe fabrication, isometrics, flow diagrams, and instrumentation. Includes laboratory work on various drawing problems.
- 5483 Pipe Drafting 2** **3**  
 Provides further instruction in pipe drafting methods. Includes laboratory projects.
- 5484 Pipe Drafting 3** **3**  
 Emphasizes petrochemical, conventional power, nuclear power, and solar power piping.
- 5485 Medium Construction Structural Drafting** **3**  
 Introduces precast concrete plans, sections, connections, and details appropriate to the designing of a model. Emphasis is given to structural poured-in-place concrete and poured stairs and ramps.
- 5486 Heavy Construction Structural Drafting** **3**  
 Provides supervised experience on a drafting project. Includes study of steel components such as beams, girders, columns, joists and decking.
- 5490 Graphics Programming** **4**  
 Introduces computer graphics, including high resolution graphics and two- and three-dimensional concepts used in plotting circles, scaling, and rotation.
- 5491 Basic Programming** **4**  
 Presents fundamentals of programming as applied to engineering and design. Includes terminology, flowcharts, editing, loops, and files.
- 5492 Computer Operations** **3**  
 Introduces basic programming and software operations for use in various fields of study.
- 5501 Security Fundamentals** **4**  
 Presents the historical, philosophical and legal bases of modern security practices. Examines the role of security and the professional security person, and surveys administrative, personnel, and physical aspects of the security field.



- 5514 Interviewing** **4**  
 Focuses on the communicative process as it pertains to the interviewing of victims, witnesses, informants, and complainants. Demonstrates professional techniques for questioning suspects and persons in custody.
- 5522 Safety and Fire Prevention** **4**  
 Studies principles and practices of safety, management of a safety program, interpretation and application of safety regulations, fire prevention and control, property conservation occupational hazards, and personal safeguards.
- 5530 Loss Prevention** **4**  
 Provides an overview of the functional operations in specialized areas of security, including theft and risk control, security surveys, and loss prevention management in proprietary and governmental institutions.
- 5601 Basic Body Repair 1** **2**  
 Provides instruction in the characteristics of body metals and the installation of moldings, ornaments, and fasteners.
- 5602 Basic Body Repair 2** **2**  
 Presents the care and use of hand and power tools and equipment, with emphasis on tool and shop safety. Includes analysis of damaged sheet metal.
- 5603 Basic Body Repair 3** **2**  
 Studies advanced techniques of body repair, with emphasis on grinding, picking, filing. Includes plastic applications in the repair of minor damage.
- 5604 Basic Body Repair 4** **2**  
 Introduces the skills used in preparing automobiles for painting. Includes cleaning, masking, and sanding.
- 5605 Auto Body Power Tools** **4**  
 Diagnoses problems associated with the use of power tools in auto body work.
- 5606 Auto Body Hand/Hydraulic Tools** **4**  
 Instructs in the selection, use, and maintenance of hand tools for auto body repair.
- 5611 Collision Damage Repair 1** **2**  
 Teaches students how to analyze extensive body damage and to determine the tools and procedures needed to replace panels.
- 5612 Collision Damage Repair 2** **2**  
 Provides further study in the fundamentals of panel replacement, with emphasis on skill development.

**5616 Automotive Chassis and Accessory Circuits****3**

Introduces fundamentals of electrical theory, automotive components and circuits, and troubleshooting techniques. Emphasis is placed on battery construction, function, and operation.

**5617 Suspension and Alignment for Auto Body****3**

Studies the suspension and steering parts of an automobile and the theory of wheel alignment and wheel balance. Covers the five wheel alignment angles, steering wheel positioning, vehicle tracking, and wheel balancing.

**5620 Frame and Chassis 1****2**

Demonstrates use of tools and frame machines for frame and chassis repair. Includes study of terms pertaining to front suspension and rear axle.

**5621 Frame and Chassis 2****2**

Focuses on conditions found in frame damage. Instructs in the use of frame gauges, team gauges, and other measuring devices.

**5622 Frame and Chassis 3****2**

Develops skills with equipment used to attach car to frame machine. Emphasis is placed on correction of minor frame misalignments.

**5623 Frame and Chassis 4****2**

Trains in the repair of major frame damage. Includes inspections, analyses, and procedures for restoring body structure alignment. Attention is given to unibody automobiles.

**5624 Auto Body Welding****2**

Studies applications of welding techniques relating specifically to automotive body repair. Emphasis is placed on welding techniques for the repair and replacement of panels.

**5625 Auto Paint Shop Practice 1****2**

Introduces auto painting, with emphasis on the handling of materials and equipment.

**5626 Auto Body Sheet Metal Alignment****2**

Demonstrates alignment of sheet metal, doors, trunks, and glass, body sealing, maintenance, and elimination of rattles. Offers experience in the alignment of all types of body panels and glass, with attention to appearance, operation, and finishing or sealing of parts.

**5630 Collision Damage Appraising****2**

Studies uses of estimation guides, procedures for itemizing damage, meanings of abbreviations, numbers of parts, and uses of time and money conversion tables. Emphasizes damage inspection, recording on estimate sheets, and the calculation of costs.

- 5631 Upholstering** 2
- Demonstrates techniques of automobile interior refinishing. Includes study of spring construction, filling, and fabrics. Develops manipulative skills through practice projects on seats, panels, and arm rests.
- 5632 Auto Paint Shop Practice 2** 2
- Presents theory and procedures pertaining to spot repair and total car refinishing.
- 5633 Aluminum Panel Fabrication and Repair** 2
- Introduces the tools, materials, and processes used in the fabrication and repair of aluminum panels.
- 5636 Auto Paint Refinishing** 2
- Instructs in the total refinishing of an automobile. Emphasizes treatment of the automobile as a complete unit.
- 5637 Custom Paint Refinishing** 2
- Provides further training in auto painting, with emphasis on metallic finishes, air brush work, blending of colors, and working up new strippings. Also introduces the first steps in art work.
- 5638 Glass Installation** 2
- Examines different types of automobile glass and their uses. Demonstrates how to remove and install front and rear glass, install and adjust side glass, bond the rearview mirror support, and use rubber channel and synthetic rubber adhesive.
- 5639 Fiberglass/Plastic Repair** 2
- Introduces types of fiberglass and plastic materials used in auto body repair. Covers both interior and exterior applications.
- 5642 Welding For Auto Body** 3
- Introduces basic welding procedures and techniques pertaining to automotive body repair. Emphasis is placed on safety.
- 5801 Engine Tune-up and Testing** 3
- Presents techniques for testing conventional and electronic ignition systems, the fuel system, and emission controls. Also includes engine testing and tune-up.
- 5812 Automotive Chassis and Suspension** 3
- Studies various frame designs and suspension components used in automobile construction. Demonstrates the repair and service of ball joints, idler arms, tie rod ends, and other suspension components.
- 5813 Automotive Braking Systems** 3
- Studies the theory, service, and repair of automotive braking systems and their components. Emphasis is placed on hydraulic theory and the repair and service of

booster units, master cylinder, wheel cylinder, caliper rebuilds, and drum and rotor service.

### **5814 Automotive Front End Alignment 3**

Studies fundamentals of wheel alignment and balance. Attention is given to each of the five wheel alignment angles, steering wheel positioning, vehicle tracking, and wheel balancing.

### **5815 Performance Fundamentals 3**

Demonstrates how to improve performance and fuel economy in today's automobiles. Special emphasis is placed on the selection of replacement parts and the modification of existing parts to obtain predetermined goals in vehicle response and fuel mileage.

### **5818 Automotive Braking System Applications 3**

Correlates principles, techniques, and procedures pertaining to various types of hydraulic braking systems used in the automotive field.

### **5819 Chassis and Suspension Applications 3**

Correlates principles, techniques, and procedures pertaining to various types of front end alignments used in the automotive field.

### **5821 Engine Theory and Design 3**

Covers internal combustion engines, including theory of operation, design characteristics, construction, and diagnosis of problems.

### **5822 Engine Tools and Equipment 3**

Familiarizes the student with the tools, machines, and equipment used in rebuilding internal combustion engines.

### **5823 Basic Electricity 3**

Introduces electrical theory and automotive circuits and components. Emphasis is placed on principles, construction, function, and operation of batteries.

### **5825 Fuel and Carburetion—Theory and Circuits 3**

Studies automotive fuels, carburetor fundamentals, circuits, and diagnostic procedures.

### **5826 Fuel and Carburetion—Overhaul 3**

Demonstrates shop procedures for troubleshooting, repair, and replacement or overhaul of fuel system components.

### **5828 Ignition Systems 3**

Presents principles of electronics, with emphasis on the electronic ignition systems used in modern automobiles.

- 5832 Starting and Charging Systems - Testing** **3**  
 Studies principles, construction, function, operation, and testing of automotive electrical units. Includes starting motors, batteries, and charging systems.
- 5833 Starting and Charging Systems - Overhaul** **3**  
 Provides comprehensive study of all electrical systems and components, with emphasis on problem diagnosis and bench repair of units.
- 5834 Engine Overhaul** **3**  
 Covers tear-down, inspection, measuring, cleaning, machining, repair, and assembly techniques pertaining to engine overhaul. Attention is also given to cooling systems.
- 5835 Manual Transmission Overhaul** **3**  
 Studies theory, operation, troubleshooting, and repair of the power train, with emphasis on operation and maintenance of clutches and manual transmissions.
- 5837 Automotive Service** **3**  
 Provides an overview of the automotive service industry through discussion of selected topics.
- 5842 Automotive Diesel Engine Overhaul 1** **3**  
 Studies the 2- and 4-stroke diesel engine, including review of automotive diesel engine theory. Covers operation and repair of the valve train; cylinder block components; lube, fuel, and cooling systems and components; and engine rebuilding techniques and diagnosis.
- 5843 Differentials and Rear Axle Overhaul** **3**  
 Studies the power train, with focus on the transfer of power from the engine to the wheels. Emphasis is placed on universal joints, differentials, and rear axle assemblies.
- 5845 Advanced Tune-up** **3**  
 Outlines diagnostic procedures and stresses the importance of troubleshooting. Special attention is given to factors that assure good automotive performance. Provides laboratory experience in diagnosis and evaluation.
- 5846 Vehicle Inspection and Safety** **2**  
 Examines federal and state regulations pertaining to automotive safety devices and their operation. Emphasis is placed on methods of vehicle inspection to comply with federal and state laws.
- 5847 Air Conditioning - Theory, Service, and Components** **3**  
 Studies theory, component function, and normal minor service maintenance.
- 5848 Air Conditioning - Diagnosis and Repair** **3**  
 Covers diagnosis of air conditioning malfunctions and the repair, replacement, and overhaul of components.

**5849 Automotive Diesel Engine Overhaul 2 3**

Studies diesel engine rebuilding techniques and procedures, with emphasis on laboratory practice.

**5850 Automotive Diesel Engine Theory 3**

Studies the automotive diesel engine, including theory of operation; design characteristics; component nomenclature, relationships, and location; and basic diagnostic techniques.

**5851 Automotive Accessories 3**

Studies the function, construction, and operating principles of automotive accessories, including lighting and signalling systems, headlight dimmers, electrically operated safety devices, buzzers, flashers, and electric motor-operated devices. Emphasis is placed on troubleshooting techniques.

**5852 Engine Tune-up 3**

Focuses on principles of automotive engine and component operation that support good performance. Provides laboratory experience in diagnosis, evaluation, and complete tune-ups.

**5854 Automatic Transmission-Theory and Operation 3**

Studies automatic transmissions, including construction, function, and principles of operation. Emphasis is placed on power flow within the transmission.

**5855 Automatic Transmission - In-Car Service 3**

Provides training in operational diagnosis and preventive maintenance servicing of automatic transmissions.

**5856 Automatic Transmission-Bench Overhaul 1 3**

Offers practical experience on transmission simulations and components.

**5857 Automatic Transmission-Bench Overhaul 2 3**

Offers theory and practice in the overhaul of automatic transmissions. Includes diagnosis, testing, and correction of malfunctions on live transmissions.

**5859 Motorcycle Maintenance 3**

Covers general motorcycle maintenance, with emphasis on preventive maintenance, tire changing, and engine tune-up. Includes pre-ride inspection, clutch and brake adjustments, battery service, and changing fork oil.

**5860 Emissions Control 3**

Introduces the purpose and function of emissions control systems. Also covers diagnosis, repair, and maintenance of the components of emission control systems.

**5861 Automotive Blueprint Reading 4**

Presents fundamentals of blueprint reading and sketching as applied to automobile components.

### **5862 Comprehensive Diagnosis and Procedures 1 3**

Develops advanced skills in diagnosis and major and minor repair to journeyman's standards. Offers minimal supervision in a work environment simulating that of an automotive service center.

### **5863 Comprehensive Diagnosis and Procedures 2 3**

Develops advanced skills in diagnosis and major and minor repair to journeyman's standards. Offers minimal supervision in a work environment simulating that of an automotive service center.

### **5864 Automotive Parts Handling 3**

Studies the facility and personnel requirements for an efficiently run parts department. Emphasis is placed on principles, practices, and procedures, using a profitable operation as an example. Familiarizes the student with manufacturers' catalogs and component numbering systems, and demonstrates techniques for installing and maintaining a practical inventory control system.

### **5865 Service Organization and Management 3**

Studies methods of scheduling time and work in the service shop and techniques of obtaining maximum work efficiency from mechanics and specialists. Includes general principles of service station sales, service, and customer relations.

### **5866 Occupational Safety and Health for Auto Service Environment 4**

Introduces principles and techniques pertaining to occupational safety and health.

### **5867 Basic Shop Practice 2**

Studies fundamental shop procedures, safety, tools, and machines

### **5868 Small Engine Maintenance 3**

Presents theory of operation, service, and adjustment of small engines. Emphasizes skill development in the diagnosis, repair, and rebuilding of small engines.

### **5869 Recreational Vehicle Maintenance 3**

Studies the special characteristics and maintenance problems of recreational vehicles.

### **5870 Common Auto Sense 1 2**

Provides instruction in auto maintenance for the automobile owner. Covers routine maintenance, economical operation, elimination of objectionable noises, care of interior and exterior appearance, and warranty regulations.

### **5871 Common Auto Sense 2 2**

Discusses more complex maintenance operations and emergency road procedures.

- 5872 Diesel Refresher** **1**  
Reviews various types of diesel engines used in automobile and commercial fields and procedures for periodic inspections and tune-ups.
- 5875 Diagnostic Applications 1** **3**  
Applies conventional tune-up principles, techniques, and procedures to engines of various designs.
- 5876 Engine Overhaul Application** **3**  
Applies engine overhaul principles, techniques, and procedures to engines of various designs.
- 5877 ASE Mechanic's Certification Refresher Course** **3**  
Reviews the material covered on the ASE Mechanics certification tests and prepares the student for the certification examination.
- 5879 Welding Practice for Auto Service** **3**  
Introduces basic welding procedures pertaining to automotive service, with attention to safety. Emphasizes techniques specific to auto service.
- 5881 Domestic Diesel Engine Theory** **3**  
Familiarizes students with the automotive diesel engine. Studies the operating principles and identifies the major subsystems. Provides training in servicing intake and exhaust, cooling, and lubrication systems.
- 5882 Domestic Diesel Fuel System Service** **3**  
Offers in-depth study and application of domestic diesel fuel system service. Demonstrates how to make adjustments on fuel system components, replace injector lines and injectors, bleed fuel systems, replace injector pump, test and replace glow plugs, and test injector pump housing fuel pressure.
- 5883 Domestic Diesel Engine Diagnostics** **3**  
Provides in-depth study of automotive diesel engine diagnostic procedures. Using a GM-350 C.I.D. or similar engine coupled to an engine dynamometer, students will graph diesel engine performance under various conditions determined by the instructor.
- 5890 Small Gas Engine Overhaul** **3**  
Covers disassembly, inspection, measuring, cleaning, machine repair, and assembly techniques used in the overhaul of small gas engines. Also includes the overhaul of carburetors and ignition systems and the maintenance and rebuilding of two- and four-cycle engines.
- 5891 Computerized Engine Control Systems** **3**  
Studies the major components of computerized engine controls governing fuel, ignition, and emission systems. Includes diagnostic testing techniques designed to monitor and improve performance, increase fuel economy, and reduce emissions.



- 6001 Carpentry Fundamentals** **3**  
Presents the history of the carpentry trade, traditional and progressive building techniques, and current construction methods and trends.
- 6002 Construction Tools and Skills** **3**  
Studies the use of various types of construction tools. Emphasis is placed on safety, maintenance, and skill development.
- 6003 Construction Materials** **3**  
Provides in-depth study of the manufacturing process, materials used in the building industry, and systems of purchasing
- 6004 Safety and First Aid** **3**  
Studies principles of safety and first aid procedures and techniques applicable to trade and industry. Includes a practicum in environmental emergency care and effective safety protection.
- 6011 Floor and Wall Layout and Construction** **3**  
Examines the design and construction of floor and wall systems. Develops the skills needed for layout.
- 6012 Roof Construction** **3**  
Studies the design and construction of roof systems. Emphasizes use of the framing square.
- 6013 Blueprint Reading 1** **3**  
Provides instruction and practice in the use of working drawings. Attention is given to the relationship of view and details, interpretation of dimensions, transposition of scale, tolerances, electrical symbols, sections, material symbols and lists, architectural plates, room schedules, and plot plans.
- 6014 Electrical Wiring Fundamentals** **3**  
Studies basic electricity, including electron theory, Ohm's Law, use of electrical measuring instruments, simple series and parallel circuits, switching devices, and fusing
- 6015 Residential Wiring 1** **3**  
Covers the practice of residential wiring, including electrical service, metering equipment, lighting, switches, outlets and other common components, installation, and maintenance.
- 6016 Electrical Wiring 1** **3**  
Studies the care and safe use of electrical wiring tools and equipment. Emphasizes safety measures for prevention of fires while working with electricity.
- 6017 Electrical Installation 1** **3**  
Studies interior wiring systems and methods of installation. Trains the student to

assess types and quantity of wire needed and to select appropriate methods and equipment for an installation.

### **6018 Residential Wiring 2 3**

Provides further study in residential service, with emphasis on metering equipment and branch circuiting.

### **6020 Electrical Blueprint 3**

Studies common blueprint problems encountered by electricians in commercial building. Trains the student to translate blueprint information into appropriate methods of installation.

### **6021 Carpentry - Advanced Framing 3**

Studies the layout and construction of floors, walls, and roofs. Emphasis is placed on skill development and time factors in framing.

### **6022 Plumbing Design and Installation 1 3**

Presents techniques for working with pipes and fittings. Demonstrates how to rough in plumbing and install drainage, water systems, fixtures, and water heaters in compliance with the plumbing code.

### **6023 Blueprint Reading 2 3**

Develops proficiency in the interpretation of more complex blueprints. Studies notations and conventional symbols and dimensions. Introduces fundamentals of mechanical drafting.

### **6024 Plumbing Fundamentals 3**

Studies the operation and function of the home plumbing system. Introduces pipe drawings and isometric pipe layout, blueprint symbols, and use of an architect's scale.

### **6025 Plumbing Blueprint 3**

Develops skills in reading, comprehending, and interpreting blueprints for residential plumbing. Covers pipe drawings and isometric pipe layout, blueprint symbols, and use of an architect's scale.

### **6026 Advanced Skills in Masonry 3**

Covers building of corners, wall reinforcing, masonry supports, chases, small one-flue chimneys, corbelling, and wall copings. Emphasis is placed on residential veneering, cavity wall construction, concrete reinforcement, and special finishes.

### **6027 Masonry Estimating and Specifications 3**

Studies masonry specifications, line and symbol identification, dimensioning, and scaling in working drawings. Emphasis is placed on residential construction.

### **6028 Plumbing Design and Installation 2 3**

Provides further instruction and skill development in working with pipes and fit-

tings. Includes installation of water and drainage systems, fixtures, and water heaters in compliance with the plumbing code.

### **6029 Plumbing Design and Installation 3**

Studies residential and commercial electric hot water heating systems, private well water systems, and electrical components of plumbing systems.

### **6030 Electrical Estimating 3**

Studies building plans and specifications, takeoffs and quantity surveys, current pay scales, and materials and labor costs.

### **6031 Commercial Wiring 3**

Introduces wiring methods and materials in conformance with the National Electrical Code. Presents fundamentals of mechanical and electrical installations, with emphasis on tool use and material selection.

### **6032 Exterior Trim 3**

Demonstrates and develops skills in exterior finishing of buildings. Covers installation of cornices, windows, doors, and various types of sidings.

### **6033 Interior Trim 3**

Demonstrates how to measure accurately, cut and fit moldings, install paneling and finish flooring, hang doors, and install hardware and cabinets.

### **6034 Millwork 3**

Introduces fundamentals of cabinetry and millwork.

### **6035 Plumbing Estimating 3**

Instructs in estimating the cost of a complete plumbing system. Includes compiling quantity surveys and takeoff from blueprint specifications, labor costs, types of material, and necessary equipment.

### **6036 Masonry and Concrete Fundamentals 3**

Studies materials and methods of construction, building layout, preparation of the building site, footings and foundations, and wall construction, including the construction and erection of forms. Emphasis is placed on the properties of brick and concrete block and the use of masonry tools and materials.

### **6037 Electrical Troubleshooting Techniques 3**

Presents methods and techniques for troubleshooting appliances, motors, motor starters, relay wiring, and residential wiring systems.

### **6041 Special Problems in Masonry Construction 3**

Studies chimneys, stone and rock masonry, metal preformed fireplaces, archways and supporting openings in masonry, and chimney design and sizing.

- 6043 Sheet Metal** **3**  
Studies metal framing materials used in residential and light commercial construction and exterior siding and cornice installation.
- 6044 Survey and Measurement** **3**  
Introduces fundamentals of surveying, including use of the transit, reading angles, land descriptions, restrictions, and legal problems. Examines topographical maps and their uses.
- 6045 Special Problems in Concrete** **3**  
Studies types of concrete finishes, reinforcing, footing designs, and waterproofing construction techniques, with attention to jointing requirements, design mixes, and curing procedures.
- 6046 Aluminum Siding Application and Residential Metal** **3**  
Trains in the installation of aluminum siding, soffits, cornices, rain gutters, trims, and windows. Also covers raised seam and corrugated metal roofing and metal carports, awnings, and storage buildings, ventilators, and flashings.
- 6047 Cabinetry** **3**  
Provides training and develops skills in cabinet building. Covers cabinet construction and installation, hardware, and countertops.
- 6048 Industrial Wiring** **3**  
Covers wiring methods and materials in conformance with the National Electrical Code. Emphasis is placed on AC/DC machines and controls.
- 6049 Commercial Installations - Plumbing** **3**  
Offers in-depth study of commercial plumbing, with emphasis on code requirements and commercial blueprints. Includes plumbing for schools, office buildings, and churches.
- 6050 Advanced Masonry and Design** **3**  
Studies masonry building design and the planning of a structure using masonry units. Also covers fireplace construction techniques and the selection of materials.
- 6051 Remodeling and Addition** **3**  
Examines problems encountered in the remodeling of residential and light commercial buildings. Attention is given to materials, utilities, permits, financing, and construction.
- 6052 Cabinetry and Millwork** **3**  
Develops skills in the combined areas of cabinetry and millwork.
- 6053 Electrical Installation** **3**  
Studies practical applications of wiring and design. Includes circuit and conduc-

tor calculations, motor circuits and controls, transformer and entrance layouts, illumination design, machine tool hookup, and circuiting.

### **6054 Electrical and Plumbing - Mechanical Installation 3**

Develops skills in the use of electrical and plumbing equipment. Covers residential and commercial installations, troubleshooting, service, and repair in conformance with codes.

### **6055 Mechanical Installation 3**

Studies the operation of mechanical equipment and the installation of air conditioning, heating, cooling, humidification, and air cleaning systems that use mechanical equipment. Includes coordination of carpentry skills with the installation of mechanical equipment.

### **6056 Estimating and Specifications - Carpentry 3**

Studies methods of estimating building costs, with emphasis on specifications, labor, and material takeoff and pricing.

### **6057 Advanced Survey 3**

Covers subdivision layouts, property zoning, easements, restrictions, legal descriptions, and building lines. Instructs in solving area problems for angles and in using trigonometry to calculate length and area.

### **6058 Woodworking Fundamentals 3**

Surveys employment areas and opportunities in woodworking industries and provides instruction in the operation of various types of woodworking machinery.

### **6059 Woodworking Applications 3**

Offers experience in the use of hand tools and machines. Progresses from elementary to advanced woodworking projects.

### **6060 Advanced Residential Design 3**

Studies floor plans and elevations for residential housing, including duplexes, apartments, and condominiums. Also studies arrangements suited to contemporary living; the satisfaction of human needs with regard to costs, privacy, convenience, and efficiency; and aesthetic values and costs of various exterior styles. The student will prepare a perspective drawing that incorporates research of the above factors.

### **6061 Basic Painting and Staining 3**

Demonstrates the application of paints and stains commonly used in the construction industry. Attention is given to the preservation functions of paints and stains and to the selection of materials for various decors.

### **6062 Wall and Floor Coverings 3**

Studies modern interior floor and wall covering materials and the procedures used in installing them. Illustrates how different materials may affect decor. Includes assessment of the durability of commonly used materials and instruction in maintenance.

**6063 Heavy Equipment Operation and Maintenance 3**

Studies the operation and maintenance of heavy machines, such as backhoes, tractors, bulldozers, trenchers, forklifts, bobcats, scootcretes, vibrators, compactors, and air hammers. Attention is given to cost, maintenance, capabilities, and limitations of the machines. Students will observe and operate equipment in the field.

**6064 Landscape Architecture and Design 3**

Examines problems of residential, commercial, and recreational landscaping. Evaluates formal and informal designs with regard to use. Includes patios, fencing, plantings, and pools, with attention to topography, orientation, layout, trends, color, shape, scale, form, function, and costs.

**6065 Cabinetry 1 3**

Introduces the basic skills and technology of cabinetmaking, focusing on cabinet designs and layout, terminology, tools, and skill requirements.

**6067 Cabinetry 2 3**

Covers the construction, design, and layout of kitchen cabinets, with emphasis on use of tools and materials.

**6068 Carpentry for Cabinetmakers 3**

Introduces basic carpentry, with attention to floor, wall, and roof systems, interior trim, remodeling, terminology, construction methods, and layout of projects.

**6069 Millwork 1 3**

Introduces the production of wood products using millwork technology. Presents the setup and operation of machinery and demonstrates techniques involving joints, fasteners, hardware, and wood materials for making moldings, door frames, picture frames, and window sashes.

**6072 Construction Project Management 3**

Introduces the planning, scheduling, and execution of construction projects, with special attention to concepts presented in Program Evaluation and Review Technique (Pert) and Critical Path Method (CPM).

**6073 Project Estimating 3**

Instructs in bidding procedures, with attention to content and form. Emphasis is given to estimation of overhead and profit.

**6074 Energy Conservation Technology 3**

Provides an overview of energy conservation techniques in current use or in development. Examines new materials, construction methods, and alternative approaches to energy conservation in new and existing structures.

**6075 Solar Energy Concepts 3**

Provides in-depth study of the solar energy industry. Gives critical examination to solar energy concepts and devices and to the claims made for them.

## **6076 Electrical Installation 2 3**

Presents practical applications of electrical wiring and design. Includes circuit and conductor calculations, motor circuits and controls, transformer and entrance layouts, illumination design, and machine tool hook-up and circuiting.

## **6080 Auxiliary Building Design and Construction 3**

Develops carpentry skills pertaining to the construction of garages, storage barns, wood decks and patios, gazebos, and fences. Complements other courses in residential construction.

## **6081 Fabrication - Modular Techniques 3**

Studies concepts and techniques of modular construction. Covers prefabrication, fabrication, and the erection of modular units assembled at the job site.

## **6082 Building Additions 3**

Focuses on the design and construction of additions to existing structures. Includes matching of styles, materials, floor levels, and Also covers connecting roofs, slopes, foundation, wiring, heating, and workmanship.

## **6083 Construction Organization and Procedures 3**

Introduces construction organization and management procedures, with attention to work and subcontractor schedules, inventories, ordering of materials, finances, building codes, inspections, and permits.

## **6087 Millwork 2 3**

Provides further training in the production of wood products using millwork technology. Develops skill with joints, fasteners, hardware, and wood materials for making moldings, door frames, picture frames, and window sashes.

## **6088 Cabinetry 3 3**

Develops skills in the design, layout and construction of cabinets. The student will design and fabricate a complete set of kitchen cabinets, including the construction and mounting of the counter top.

## **6089 Advanced Projects in Cabinetry and Millwork 3**

Provides opportunity for the student to develop knowledge and skills through execution of designated construction projects under limited supervision.

## **6090 Advanced Projects in Building Construction 1 3**

Provides opportunity for the student to demonstrate knowledge and skills through execution of designated construction projects under limited supervision.

## **6091 Carpentry—Light Commercial 3**

Introduces carpentry skills required in light commercial construction. Focuses on construction methods and materials used for office buildings, clinics, small churches, and other nonresidential structures.

**6092 Carpentry - Heavy Commercial 3**

Trains students in carpentry skills required in the construction of factories, hospitals, schools, shopping centers, and other commercial buildings. Emphasis is placed on steel framing and form construction.

**6093 Special Problems in Building Construction 3**

Examines construction problems and possible solutions.

**6094 Advanced Projects in Building Construction 2 3**

Provides opportunities for the student to demonstrate knowledge and skills through execution of designated construction projects under limited supervision.

**6095 Construction Research 3**

Offers opportunities for field projects or case studies within the student's occupational specialty. Projects and studies may include actual work experience in business or industry and/or the collection and analysis of research data.

**6096 Construction Foreman Supervisory Training 1 2**

Examines the duties and responsibilities of the supervisor of a construction crew. Indicates what is expected from each member of the crew. Gives attention to adjusting to the role of supervisor.

**6097 Advanced Projects in Building Construction 3 3**

Provides limited supervision of a class project involving layout and construction of a small building.

**6098 Construction Foreman Supervisory Training 1 3**

Examines the duties and responsibilities of the supervisor of a construction crew. Gives attention to adjusting to the role of supervisor and indicates what to expect from each member of the crew.

**6099 Construction Foreman Supervisory Training 2 3**

Develops the leadership abilities and techniques necessary to deal with special problems in daily construction work.

**6216 Electrical Fundamentals 3**

Covers the fundamentals of electricity and electrical circuits as applied to electrical systems on gasoline and diesel powered units.

**6217 Diesel Electrical Systems Overhaul 3**

Studies the electrical systems design, construction, function, and operation of advanced diesel charging and cranking systems. Includes diagnosis, repair, overhaul, and testing of circuits and components of the charging and cranking systems.

**6218 Diesel Engine Reassembly and Testing 3**

Studies the reassembly of diesel engines and testing methods to determine if



engine parts are within allowable tolerance limits. Also covers restoration of the unit to manufacturer's specifications.

### **6220 Diesel Engines 1 3**

Covers the construction and operation of two- and four-cycle diesel engines, with special attention to valves, sleeves, and bearings. Includes the building of a diesel engine in the laboratory.

### **6223 Diesel Electrical Systems Testing 3**

Studies the electrical systems design, construction, function and operation of diesel charging and cranking systems. Includes diagnosis, repair, and testing of circuits and components of the charging and cranking systems.

### **6227 Diesel Engine Disassembly and Inspection 3**

Demonstrates procedures for disassembly and inspection of diesel engines. Includes use of the shop manual and special tools and equipment.

### **6230 Diesel Engines 2 3**

Studies the diesel engine block and related components. Includes engine overhaul and other laboratory work.

### **6231 Fluid Power Fundamentals 3**

Studies the principles, functions, terminology, and symbols of hydraulics and pneumatics. Covers the development of hydraulics, physical properties of liquids, advantages and problems in hydraulic setups, principles of operation, and constructional features of hydraulic pumps, motors, and valves. Attention is given also to types and uses of seals, packings, and tubing and to applications of hydraulic components in typical circuits and industrial equipment.

### **6235 Diesel Engine Theory 4**

Studies the theory of modern heavy-duty industrial diesel engines. Includes troubleshooting and use of service manuals.

### **6236 Fluid Power Fundamentals 4**

Introduces fundamentals of fluid power, including principles, functions, terminology, and hydraulic and pneumatic symbols. Emphasis is placed on hydraulic principles and equipment; development of hydraulics; advantages and problems of hydraulic setups; physical properties of liquids; operation and construction of hydraulic pumps, motors and valves; types and uses of seals, packings and tubing; and applications of hydraulic components in typical circuits and industrial equipment.

### **6240 Diesel Engine Diagnosis 3**

Covers the diagnosis and correction of malfunctions in domestic diesel engines. Includes laboratory work.

### **6243 Diesel Fuel Systems 1 4**

Introduces types of fuel systems, including various combustion chambers, used in industrial and agricultural engines.

- 6246 Diesel Engine Removal and Replacement** **3**  
 Studies the removal and replacement of diesel engines in various types of heavy-duty vehicles.
- 6251 Failure Analysis** **3**  
 Studies analysis of component failure in all areas of the diesel industry.
- 6254 Diesel Engine Upper Rebuild** **4**  
 Demonstrates procedures for disassembly and inspection of diesel engines. Includes use of shop manuals and special tools and equipment.
- 6255 Diesel Engine Lower Rebuild** **3**  
 Covers inspection of new parts and procedures for rebuilding diesel engines. Emphasizes importance of careful measurements and adherence to specifications.
- 6257 Diesel Component Rebuild** **3**  
 Demonstrates how to rebuild and check component systems such as turbochargers, air compressors, lubrication systems, and air intake and exhaust systems.
- 6258 Diesel Engine Tune-up** **4**  
 Provides training in tune-up and servicing of diesel engines. Includes disassembly of fuel system components, parts identification, and study of fuel flow paths. Emphasis is placed on Cummins Pressure Timing fuel systems.
- 6259 Diesel Fuel Systems 2** **3**  
 Studies modern fuel injection systems, with emphasis on disassembly, inspection, and reassembly of components. Attention is given also to diesel combustion requirements and thermal efficiency on two- and four-stroke-cycle diesel engines.
- 6260 Diesel Fuel Pump Calibration** **3**  
 Covers diagnosis, repair, overhaul, and testing of diesel fuel systems and components. Includes final testing and test stand calibration adjustments.
- 6261 Heavy-Duty Clutches and Manual Transmissions** **3**  
 Studies the design, function, theory of operation, diagnosis, repair, and testing of heavy-duty clutches and manual transmissions.
- 6262 Heavy-Duty Drive Lines and Rear Axles** **3**  
 Studies the design, function, theory of operation, diagnosis, repair, and testing of heavy-duty drive lines and rear axle assemblies. Emphasis is placed on universal joints, drive shafts, differentials, and rear axle assemblies.
- 6263 Heavy-Duty Brake Systems** **3**  
 Studies heavy-duty brake systems, with emphasis on diagnosis, repair, testing, and service of air brake systems and components.

### **6264 Heavy-Duty Chassis, Suspension, and Steering 3**

Studies heavy-duty truck frame designs and suspension components, with emphasis on diagnosis, repair, and testing. Covers king pins, front axles, tie rods, springs, shock absorbers, and alignment of wheels and frame.

### **6265 Heavy-Duty Automatic Transmission - Theory and Design 3**

Studies automatic transmissions used in medium- and heavy-duty trucks. Covers design, construction, function, and operating principles, with emphasis on power flow within the transmission.

### **6266 In-Vehicle Service of Heavy-Duty Transmissions 3**

Covers in-vehicle diagnosis, corrections, and testing of automatic transmissions used in medium- and heavy-duty trucks. Attention is given to preventive maintenance.

### **6267 Heavy-Duty Automatic Transmission - Bench Overhaul 1 3**

Demonstrates bench overhaul of the basic automatic transmissions and components used in medium- and heavy-duty trucks. Studies how to determine if components and systems are within tolerance limits and how to restore units to manufacturers' specifications.

### **6268 Heavy-Duty Automatic Transmissions - Bench Overhaul 2 3**

Covers bench overhaul of the more sophisticated automatic transmissions and components used in medium- and heavy-duty trucks. Demonstrates how to determine if components and systems are within tolerance limits and how to restore units to manufacturers' specifications.

### **6269 Advanced Fluid Power 3**

Covers advanced principles and functions of fluid power and the terminology and symbols pertaining to hydraulics and pneumatics. Emphasis is placed on systems design, fabrication, diagnosis, repair, maintenance, and testing.

### **6270 Mobile Air Conditioning and Refrigeration - Theory and Service 3**

Studies the theory of operation, function of components, and normal minor maintenance of commercial air conditioning units.

### **6271 Mobile Air Conditioning and Refrigeration - Diagnosis and Repair 3**

Studies diagnosis of mobile commercial air conditioning malfunctions and the repair, replacement, and overhaul of various components.

### **6310 Laundry Equipment Applications 8**

Studies diagnosis of malfunctions and the servicing of commercial and domestic electrical laundry appliances (washer and dryer units).

### **6311 Customer Relations 1**

Develops the skills necessary for successful dealings with customers.

**6313 Kitchen Product Applications****7**

Offers a practical approach to the diagnosis of problems in kitchen appliances, including ranges, compactors, dishwashers, and disposals.

**6314 Domestic Refrigeration Fundamentals****6**

Presents fundamentals of domestic refrigeration, including study of refrigerants and compressors, use of charging and evacuation equipment, and checking temperature and pressure with gauges.

**6315 Refrigeration Product Applications****6**

Offers a diagnostic approach to servicing refrigerators, freezers and window air conditioners.

**6316 Basic Electricity****3**

Includes study of series and parallel circuits, Ohm's Law, magnetism, wiring schematics, timer sequences and the electric fractional H.P. motor, and the basic control circuits.

**6409 Basic AC/DC Circuits Laboratory****2**

Provides laboratory experiments to augment Basic AC/DC Circuits (6410).

**6410 Basic AC/DC Circuits****4**

Surveys electrical laws and principles pertaining to DC and AC circuits. Includes study of current, voltage, resistance, power, inductance, capacitance, and transformers.

**6411 Basic Electronics****4**

Surveys the principles of semiconductor devices and their applications to electronic circuits. Topics include diodes, bipolar junction transistors, field effect transistors, amplifiers, oscillators, and power supply circuits.

**6412 DC Fundamentals 1****3**

Studies applications of the electrical laws and principles pertaining to DC circuits, voltage, current, and resistance relationships. Emphasizes component identification and use of laboratory test equipment.

**6413 Fabrication****3**

Provides practical experience in techniques of electronic construction, fabrication, and assembly. Emphasis is placed on the use and care of shop tools and test equipment.

**6414 DC Fundamentals 2****3**

Provides further study in applications of electrical laws and principles pertaining to DC circuits, voltage, current, and resistance relationships. Introduces inductance and capacitance.

- 6415 Basic Electronics Laboratory** **2**  
 Offers experience in applying the principles of semiconductor devices to electronic circuits. Attention is given to diodes, bipolar junction transistors, field effect transistors, amplifiers, oscillators, and power supply circuits. Supplements Basic Electronics (6411).
- 6420 Introduction to Data Processing and Computers** **3**  
 Provides an overview of computer technology and data processing. Includes study of electronic components and circuitry.
- 6423 AC Fundamentals 1** **3**  
 Introduces the principles of AC circuits, with emphasis on impedance and phase relationships.
- 6424 Troubleshooting Techniques** **3**  
 Studies techniques of troubleshooting electronic circuits and simple systems. Emphasis is placed on systematic diagnostic methods. Provides further experience in the use of shop test equipment.
- 6425 AC Fundamentals 2** **3**  
 Provides further study of the principles of AC circuits, with emphasis on resonant and AC filter circuits.
- 6426 Electronics Drafting** **3**  
 Studies techniques used in diagramming electronics circuits and systems, with emphasis on drawing, reading, and interpreting diagrams and electrical blueprints.
- 6434 Active Devices** **3**  
 Introduces the structure and operation of vacuum tube and transistor devices.
- 6435 Electronics Circuits 1** **3**  
 Studies use of active and passive components in power supply, oscillator, and amplifier circuits.
- 6436 AM Radio** **3**  
 Studies AM receiver principles and circuits, with emphasis on amplitude modulation and demodulation.
- 6438 FM Radio** **3**  
 Studies FM receiver principles and circuits, with emphasis on frequency modulation, demodulation, and multiplex.
- 6440 CET Preparation** **2**  
 Prepares students for certification as electronics technicians.

- 6441 FCC 3rd- and 2nd-Class License** **4**  
Offers concentrated study to prepare students to meet FCC 3rd- and 2nd-Class licensing standards.
- 6442 FCC 1st-Class License** **4**  
Prepares the student for the federal test for the FCC 1st-Class license.
- 6443 Indiana State Radio and Television License** **4**  
Prepares students to meet state licensing requirements.
- 6444 Advanced Radio Circuits** **3**  
Studies principles and circuits of FM stereo multiplexing, tape players, and CB transceivers, with emphasis on the function and operation of IC components used in radio systems. Laboratory exercises include alignment and troubleshooting of AM/FM Stereo, tape players, and CB radios.
- 6445 Monochrome Television** **3**  
Studies television circuitry, with emphasis on cathode ray tubes, scanning and synchronizing methods, and video amplification. Attention is given to antennas and transmission lines.
- 6446 Integrated Circuits** **3**  
Introduces classifications and categories of linear and digital integrated circuits.
- 6447 Special Semiconductors** **3**  
Introduces theory and operation of semiconductor devices other than bipolar transistors. Includes optoelectronic components, FETs, and other special semiconductor devices.
- 6448 Color Television** **3**  
Studies principles and circuits of the specialized systems used in color television receivers, with emphasis on similarities and differences in color and monochrome systems.
- 6449 Closed Circuit Television** **3**  
Studies principles of closed circuit TV, with emphasis on closed circuit TV camera operations.
- 6450 Television Troubleshooting** **3**  
Develops advanced skills in diagnostic procedures, with emphasis on service, installation, and adjustment of color and solid-state TV receivers.
- 6451 Communications Electronics 1** **3**  
Studies AM, FM, pulse, SSB, and other modulation systems. Also presents basics of facsimile systems.

- 6452 Communications Electronics 2** **3**  
 Offers further study of 2-way communication equipment, including the installation, maintenance, and troubleshooting of commercial and CB systems.
- 6453 Communications Electronics 3** **3**  
 Studies the operation and maintenance of commercial AM, FM, and television broadcast equipment and antennas. Includes study of link transmitters.
- 6454 Electronics Circuits 2** **3**  
 Presents pulse and logic circuit fundamentals, including waveforms of the non-sinusoidal variety frequently used in pulse and logic circuits.
- 6455 Circuit Analysis** **3**  
 Presents circuits and systems analysis, using equivalent circuit principles and theorems.
- 6456 Advanced Troubleshooting** **3**  
 Presents troubleshooting procedures and techniques for transmitters and receivers.
- 6457 Electromechanical Controls** **3**  
 Studies basic electromechanical control systems related to industrial electronics, including basic and pilot control devices. Includes circuit layout, industrial schematics, reduced voltage starters, and multispeed controllers.
- 6458 Magnetic Recording** **3**  
 Studies principles, maintenance, alignment, and operation of magnetic recording equipment.
- 6459 Business Practices** **2**  
 Studies general business practices associated with the operation of technical service enterprises.
- 6460 Microwave and Radar** **3**  
 Studies microwave generators, waveguides, relay systems, and components, including klystrons, magnetrons, gas diodes, and their applications.
- 6461 Antennas and Wave Propagation** **3**  
 Studies receiving and transmitting antennas and arrays, transmission lines, wave guides, and coupling circuits.
- 6462 Audio Electronics** **1**  
 Offers detailed and practical study of audiosystems for home and commercial use. Includes study of pickups, amplifiers, and speakers.

**6463 Linear Integrated Circuit Timers** 3

Trains students in the use of linear integrated circuits to obtain digital astable and monostable operations.

**6464 Phase-locked Loop** 3

Introduces the elements composing the phase-locked loop. Focuses on applications of the phase-locked loop to reception of communication signals.

**6465 Active Filters** 3

Studies low-pass, high-pass, band-pass, and notch filters using operational amplifiers. Focuses on the design of multiple pole filters and the characteristics of Butterworth and Chebyshev filters.

**6470 AC Fundamentals** 6

Introduces principles of AC circuits, with emphasis on impedance and phase relationships. Also includes inductance, capacitance, resonance, and transformers.

**6471 DC Fundamentals** 6

Studies applications of the laws and principles pertaining to DC circuits, voltage, current, and resistance relationships. Emphasizes component identification and use of laboratory test equipment.

**6502 Digital Troubleshooting** 4

Studies techniques for logical troubleshooting of digital circuits. Includes interpretation of schematic diagrams for both combinational and sequential logic circuits. Also covers the isolation of faults to the piece part level and introduces high-speed test equipment commonly used to locate faults.

**6519 Microprocessor Architecture** 2

Introduces attributes of the computer of interest to the programmer. Emphasis is placed on the structural organization and hardware design of digital computer systems.

**6520 Microprocessors 1** 3

Introduces the microprocessor, including the architecture of a typical processor, addressing modes, programming model, and instruction set. Reviews number systems, codes, and computer arithmetic.

**6521 Microprocessor Applications** 3

Emphasizes the application and interfacing of microprocessor systems. Includes hardware specifications of the principal system components, such as CPU, memory, and I/O interfacing.

**6522 D/C Equipment and Controls** 3

Studies D/C power for industry. Includes electromagnetism; D/C generators, motors, relays, controllers, and power supplies; SCR principles; and D/C maintenance practices.



**6524 Troubleshooting Techniques 3**

Studies techniques for logical troubleshooting of electronic circuits and simple systems, with emphasis on signal tracing and signal injection methods. Includes communications skills.

**6525 Test Equipment 3**

Introduces the use of lab and shop testing equipment in troubleshooting.

**6526 Audio Electronics 3**

Offers detailed, practical study of audio systems for home entertainment and commercial uses. Includes study of pick-ups, amplifiers, and speakers.

**6527 Peripherals 1 3**

Studies peripherals commonly used with small machines, including keyboards, LED displays, cassette recorders, Tarbell, and teletype.

**6530 Test Equipment Maintenance 3**

Studies the repair and calibration of electronic test equipment, including VOMs, VTVMs, signal generators, and oscilloscopes. Includes study and use of test equipment standards.

**6532 Three-Phase Systems 3**

Covers three-phase motor principles, including induction motors, synchronous motors, multispeed dual voltage motors, and three-phase motor maintenance. Also includes A/C motor starting principles, three-phase motor controllers, alternators, auxiliary generator systems, and power distribution systems.

**6533 Microprocessors 2 3**

Studies support devices and interfacing with simple I/O devices. Includes monitor programs, memory, and machine language programming.

**6534 Industrial Interfaces 3**

Studies how to design circuits to interface microprocessors with analog equipment. Also studies the conversion of energy produced by pressure, force, position, and temperature into electrical voltage or current compatible with the microprocessing system.

**6535 Peripherals 2 3**

Examines credit card readers, CRT displays, and paper-tape and floppy disk devices. Includes study of each device and the interfacing with typical small machine I/O port devices.

**6536 Programming 3**

Reviews machine language and flow charts and introduces symbolic, basic, and assembly languages. Also includes a study of editors.

- 6538 Rotating Machines 1** **3**  
Introduces common industrial rotating machines, both single and polyphase.
- 6539 Rotating Machines 2** **3**  
Offers further study of industrial rotating machines, with emphasis on power distribution.
- 6540 Medical Electronics 1** **3**  
Introduces bioelectrical potentials, including blood flow and pressure, respiration, and cardiac output, with emphasis on conversion and measurement of the physiological signals.
- 6541 Medical Electronics 2** **3**  
Offers further study of medical electronics equipment, including ECG, EKG, EEG, defibrillators, heart monitors, and other monitoring equipment.
- 6542 Medical Electronics 3** **3**  
Studies medical support systems, including X-ray equipment, respiration, and analyzers, and their maintenance. Prepares for licensing and certification.
- 6543 Basic Industrial Electronics** **3**  
Studies the characteristics and applications of various transducers.
- 6544 Industrial Controls** **3**  
Studies power switching and controlling devices, including thyristors and thyatrons.
- 6545 Solid State Motor Controls** **3**  
Reviews Ohm's Law, capacities reactance, inductive reactance, electronic symbols, and single- and three-phase power. Also covers various solid state linear and static devices and their applications in polyphase systems. Introduces transient suppression, opto isolators, electromechanical relays, and solid-state relays in industrial systems.
- 6546 Electrical Maintenance** **3**  
Focuses on the development of electrical maintenance programs for typical industrial and commercial situations. Demonstrates the use of motors and testing equipment in preventive maintenance and troubleshooting. Emphasizes protection of life, property, and production through effective use of testing equipment.
- 6547 Linear Integrated Circuits Applications** **3**  
Emphasizes circuit applications of linear ICs, including op amps, voltage regulators, and other special analog circuits.
- 6548 Programming Examples** **3**  
Provides opportunities for extensive programming in business and home applications and games. Offers experience with modern machines with suitable peripherals.

- 6549 National Electrical Code** **2**  
Covers national and local electrical codes for wiring and apparatus, methods and materials, wiring design and protection, equipment and hardware, and use of tables and diagrams for solving wiring problems.
- 6550 Electromechanical Controls** **3**  
Studies electromechanical control systems pertaining to industrial electronics. Includes basic and pilot control devices, circuit layout, industrial schematics, voltage starters, and multispeed controllers.
- 6551 DC Fundamentals 3** **3**  
Focuses on superposition and the Venin and Nortan theorems.
- 6552 AC Fundamentals 3** **3**  
Focuses on vacuum tube theory and circuits.
- 6553 Industrial Electronics 1** **3**  
Studies electronic systems and circuits.
- 6554 Industrial Electronics 2** **3**  
Studies process controls and service systems.
- 6555 Medical Electronics and Safety** **3**  
Studies applications of electronics and electronic devices to medicine. Attention is given to electrical safety and the care and use of electronic equipment
- 6562 Digital Principles 1** **3**  
Introduces combinational logic through use of Boolean algebraic expression.
- 6563 Digital Principles 2** **3**  
Emphasizes counters, clocks, registers, and arithmetic circuits.
- 6573 Microcomputer Skills for Watch Repair 1** **4**  
Introduces the fundamentals of miniaturized timekeeping. Includes measurement techniques and repair and adjustment of typical watch elements.
- 6574 Advanced Electromechanical Controls** **3**  
Studies electromechanical control systems pertaining to the field of industrial electronics.
- 6577 Digital Principles 3** **3**  
Offers advanced study of digital systems, including memory and D/A and A/D conversion. Covers construction of specified timing, circuits, and design driver/display systems; design of selected register, counters, and arithmetic circuits; and validation of operation.

- 6578 Digital Applications** **3**  
 Studies interfacing fuses of various digital devices, circuits, and systems and the development of programs in machine language. Demonstrates digital systems for specified operations.
- 6583 Electrical Safety for Hospitals** **4**  
 Studies electrical safety regulations as set forth in the Accreditation Manual for Hospitals. Attention is given to electrical wiring, the National Electric Code, and equipment calibration.
- 6584 Telecommunication Principles** **3**  
 Analyzes modems and data transmission systems. Determines optimum speed of transmission, examines line conditioning requirements to reduce error rates in remote transmission of digital data, and studies commonly used peripheral devices and their interfacing with remote terminals.
- 6632 Troubleshooting Fundamentals 1** **3**  
 Studies techniques for logical troubleshooting of electronic and simple circuits.
- 6635 Troubleshooting Fundamentals 2** **3**  
 Examines typical malfunctions, including AM and FM radio and television problems.
- 6709 Shaving Shop Application** **1**  
 Focuses on shaving a patron with a straight razor and maintenance of the razor.
- 6710 History and Professional Ethics of Barbering** **2**  
 Presents the origin of the barber; Greek, Roman and English influence on barbering; modern trends; and the ethical conduct and standards of the barbering profession.
- 6711 Bacteriology, Sterilization and Sanitation** **3**  
 Studies the types of bacteria and their importance to barbering, including the sterilization and sanitation of barbering implements and barbering facilities.
- 6712 Barbering Implements** **2**  
 Identification, use, qualification, purpose, and care of all barbering implements is presented as well as the names of the parts of all barbering implements.
- 6713 Shaving** **3**  
 Introduces the fundamentals of shaving in addition to the techniques of honing and strapping a straight razor to develop a sharp edge.
- 6714 Basic Haircutting** **5**  
 The techniques of basic haircutting are studied including the theory and practice of each technique.

<b>6715 Shampooing and Rinsing</b>	<b>3</b>
Introduces the benefits of proper shampooing and rinsing as well as the techniques of preparing the patron, selecting the shampoo, and performing the services.	
<b>6717 Basic Haircutting Shop Application</b>	<b>5</b>
Actual shop practice of techniques for a basic haircut.	
<b>6718 Shampooing and Rinsing Shop Application</b>	<b>1</b>
Actual shop practice of proper methods of shampooing and rinsing.	
<b>6719 Mustaches and Beard Shop Application</b>	<b>2</b>
Actual shop practice of cutting and styling of mustaches and beards.	
<b>6720 Mustaches and Beards</b>	<b>4</b>
Focuses on the fundamentals and techniques of styling different types of mustaches and beards, identifying and naming different styles, and cutting and shaping the mustache and the beard.	
<b>6721 Scalp and Hair Treatments</b>	<b>3</b>
Stresses the importance of scalp and hair treatments by presenting the different types of treatments and the proper selection and performance for the patron.	
<b>6722 Theory of Massage</b>	<b>2</b>
Introduces theory of massage and knowledge and performance of the massage movements of the face and scalp.	
<b>6723 Facial Treatments</b>	<b>4</b>
Presents the different types of facials, the supplies required, and the proper steps in the selection and performance of facials.	
<b>6724 Anatomy and Physiology</b>	<b>4</b>
Reviews basic knowledge of the physiology of the cell, the tissue, the organs, and the systems and the relationships of each to the anatomy of the body.	
<b>6726 Scalp and Hair Treatments Shop Application</b>	<b>3</b>
Actual shop practice of scalp and hair treatments and identification of disorders and products used for treatment.	
<b>6727 Facial Treatment Shop Application</b>	<b>2</b>
Examines facial massage, nerve points, and procedures and products used in performing facial treatments.	
<b>6730 Basic Chemistry</b>	<b>4</b>
Presents basic fundamentals of chemistry including the make-up and chemical effects of barbering supplies.	

## **6731 Electricity and Light Therapy 2**

Studies the common names and terms, the nature and effects, and safe use of high frequency current for therapy purposes as well as how and when to perform light therapy

## **6732 Skin, Scalp and Hair 3**

Presents the study of the functions, purpose and problems related to skin, scalp and hair.

## **6733 Advanced Haircutting 5**

Reviews basic hairstyling, razor and comb techniques, hair sectioning, wet or dry cutting, and other advanced techniques.

## **6734 Waving Techniques 5**

Examines various techniques of waving hair including fingerwaving and heat waving.

## **6736 Advanced Haircutting Shop Application 3**

Actual shop practice of solutions to haircutting problems.

## **6737 Waving Techniques Shop Application 3**

Actual shop practice of performing waves and wave patterns.

## **6738 Permanent Waving Shop Application 2**

Actual shop practice of permanent waving hair techniques, rolling patterns, and procedures for permanents.

## **6739 Chemical Hair Processing and Hair Coloring Applications 1**

Presents actual hair processing and basic hair coloring, identification of products, and basic chemistry.

## **6740 Chemical Hair Processing 4**

Reviews fundamentals, techniques and terminology of hair coloring and studies techniques of bleaching and straightening hair.

## **6741 Permanent Waving 5**

Examines processes, techniques and materials for permanent hairwaving.

## **6742 Shop Management 4**

Focuses on establishing a barber shop, keeping records, managing personnel, supply management, and public relations.

## **6743 Hair Styling 5**

Studies modern day styles and cutting techniques.

- 6745 Combined Techniques Shop Application** **3**  
 Actual shop practice in performing any of the tasks that have been learned in the program with at least 75% accuracy.
- 6746 Hair Styling Shop Application** **4**  
 Actual shop practice in different cutting patterns, selecting correct style for patron and correct balance and height in styling.
- 6901 Manufacturing Processes** **3**  
 Familiarizes the student with manufacturing processes, equipment, selection of materials, and capabilities of modern machine tools. Studies basic methods of fabrication, with attention to measuring and gauging devices to insure accuracy.
- 6903 Sensor and System Interfacing** **3**  
 Studies the operation and application of limit switches and photoelectric and proximity sensors. Covers interfacing of all discrete sensors with robot and programmable controllers. Attention is given also to basic interfacing techniques used in digital networks.
- 6905 Robotics Principles 1** **3**  
 Provides an overview of the current robotics industry, beginning with a brief history and a review of the basic terms used in the field. Classifies robots by geometry, power source, application, path control, and intelligence. Includes operation of different types of end effectors, robot controllers, and system sensors. Covers basic programming techniques for the Cincinnati and Puma robot systems.
- 6907 Robotics Principles 2** **3**  
 Studies the operation, installation, and maintenance of low-technology pneumatic robot systems, including operation and programming of programmable controllers. Also includes operation of hydraulic and electric robot systems and additional programming on high technology systems.
- 6909 CAD/CAM Fundamentals** **3**  
 Introduces principles of computer-aided drafting and design and computer-assisted manufacturing. Offers laboratory experience in programming actual CNC equipment. Attention is given to various types of CAD/CAM systems.
- 6911 Work Cell Design** **3**  
 Studies principles pertaining to the design and implementation of robots in industrial work cells. Attention is given to selection of the best work site and robot system, application of cell sensor, development of cycle times, economic analysis, safety considerations, proposal preparation, and human resources development.
- 6913 Automated Manufacturing Systems 1** **3**  
 Covers the identification, operation, and application of the many systems integrated into flexible manufacturing systems. Attention is given to material-handling hardware; forming, shaping, and processing machinery, automatic warehousing and storage equipment; and CAM control systems.

**6915 Automated Manufacturing Systems 2 3**

Presents basic concepts of hard automation systems and automated assembly. Emphasis is placed on fully automated production system design and operation.

**6917 Advanced Robotic Systems 3**

Studies the operation of high-technology work cells, including vision systems, tactile sensing, off-line programming, interfacing to external computers, and voice input and output. Emphasizes use of vision and touch sensing.

**6919 Manufacturing System Control 3**

Introduces measuring devices used in the monitoring and automatic control of industrial processes. Studies terminology, principles, and system configurations, including computer control feedback, data acquisition, and analog/digital conversions. Attention is also given to controllers and servos.

**6921 Failure Analysis Techniques 3**

Demonstrates procedures used to isolate faults in highly automated manufacturing systems. Emphasis is placed on trouble-shooting techniques for quick identification of system problems.

**6923 Applied Mechanisms 3**

Studies concepts, operational principles, and applications of industrial mechanisms, including drives, linkages, valves, fans, and blowers. Attention is given to maintenance, repair, and replacement procedures.

**6925 System Project 2**

Offers opportunity for each student to apply acquired knowledge of automated systems to the resolution of an actual industrial manufacturing problem.

**7112 Heating Fundamentals 3**

Studies fundamentals of the heating phase of air conditioning, including types of units, parts, functions, and applications. Attention is also given to the combustion process, heat flow, temperature measurements, and basic control devices.

**7113 Basic Electricity 3**

Introduces fundamentals of electricity, including theory of current flow, Ohm's Law, current voltage and resistance measurements, and use of electrical measuring instruments. Also includes switching circuits; magnetism; transformers; fusing and wire sizing; series, parallel and combination circuits; and an introduction to pictorial and schematic wiring diagrams.

**7114 Basic Mechanics and Shop Techniques 3**

Introduces safe and efficient use of tools and torches in the installation of copper tubing and copper and steel piping. Instructs in the use of soldering, brazing, and oxyacetylene gas welding apparatus appropriate to specific materials.



### **7123 Air Conditioning and Refrigeration 1** **3**

Studies the compression system used in mechanical refrigeration and air conditioning. Covers the refrigeration cycle, compressors, receivers, evaporators, condensers, metering devices, and refrigerants. Attention is given also to temperature conversions, absolute temperature, and gas laws. Introduces basic mechanical service procedures used throughout the industry.

### **7124 Heating Service (Gas and Oil)** **3**

Deals with gas and oil heating units for residential use. Demonstrates analytical methods for solving mechanical and electrical equipment problems. Attention is given to pictorial and schematic diagrams.

### **7125 Motors and Motor Control** **3**

Covers various types of motors, including single-phase capacitor start, capacitor start and run, shaded pole, tap wound, and 3-phase motors. Demonstrates how to select the proper motor for a specific application and how to diagnose motor problems. Emphasis is placed on motor control and protective devices.

### **7126 Air Conditioning and Refrigeration 2** **3**

Provides further study of compressors, receivers, evaporators, condensers, metering devices, and other system components. Emphasis is placed on mechanical service procedures.

### **7127 Heating Service - Electrical and Hydronic** **3**

Studies electric and hydronic heating systems for residential use and the methods used to analyze electrical and mechanical problems. Includes study of control systems and pictorial and schematic diagrams.

### **7133 Cooling Service - Electrical** **3**

Covers service procedures for residential air conditioning systems and low voltage (24 volts) control wiring. Emphasis is placed on schematic and pictorial wiring diagrams.

### **7134 Cooling Service - Mechanical** **3**

Covers troubleshooting techniques, procedures for cleaning a system following compressor burnout, suction and liquid line filters, and strainer-dehydrators.

### **7135 Electrical Circuits and Controls** **3**

Covers electrical, gas, oil, cooling, and system controls. Studies the operation of individual controls and their integration into control systems.

### **7136 Psychrometrics** **3**

Covers methods of estimating heat loss and gain in commercial and industrial work. Introduces use of the psychrometric chart in calculating air qualities and quantities. Emphasis is placed on selection of equipment and on coil, blower, and duct sizing. Includes study of ventilation systems.

**7137 Heat Loss and Gain Calculations****3**

Covers methods of calculating heat loss and gain in the sizing of units for residential application. Attention is given to methods of reducing energy consumption in residences.

**7143 Blueprint Reading****3**

Instructs in blueprint-reading relevant to the heating and cooling trade. Includes floor plans, elevations, sections, details, plot plans, and mechanical plans. Demonstrates how to make tracings of blueprints and layouts of air conditioning systems. Also covers the use of symbols, notations, and schedules on drawings. Emphasis is placed on lettering techniques and neatness and clarity in drafting.

**7144 Commercial Refrigeration****3**

Studies air conditioning and refrigeration systems for light commercial use, including medium and low temperature applications. Covers refrigeration accessories, metering devices, and mechanical and electrical controls. Introduces electrical and hot gas defrost systems.

**7145 Heat Pump Service****3**

Studies heat pumps used in residential applications. Includes types of systems, system control, balance points, C.O.P. ratings, and pictorial and schematic diagrams.

**7146 Advanced Cooling Service****3**

Covers methods of troubleshooting electrical and mechanical components of central air conditioning systems.

**7147 Uniform Mechanical Codes****2**

Studies state and local codes and ordinances covering the erection, installation, alteration, repair, relocation, replacement, addition to, use of, and maintenance of heating, ventilating, cooling, and refrigeration systems and their components.

**7151 Energy Management****3**

Studies the design or retrofit of residential and commercial buildings for adequate thermal resistance and low air leakage. Attention is given to the selection of mechanical, electrical, and illumination systems and equipment to provide effective use of energy. Study includes heat reclaiming systems and their applications in new and existing buildings.

**7152 Air Balancing****3**

Studies the measurement of air flow in heating, air conditioning, ventilating, and exhaust systems and the adjustment of fan speeds, dampers, and other air regulating devices. Attention is given to air velocities, noise control, and effects of duct sizing on fan brake horsepower. Students will prepare air balance reports.

**7153 Advanced Commercial Refrigeration****3**

Provides opportunities to work with heavy commercial equipment. Studies metering devices, accessories, and advanced control arrangements. Emphasizes trouble diagnosis and safety precautions in dealing with refrigerants and heavy equipment.

### **7154 Duct Fabrication and Installation 3**

Studies layout and fabrication of ducts and fittings. Covers use of sheet metal hand tools and shop equipment.

### **7155 Specifications and Estimating 3**

Studies use of job and equipment specifications, blueprints and engineering data to take-off a job and determine the costs of materials, labor, and equipment. Covers overhead, job-related costs, labor costs plus fringes, warranty coverages, taxes, permits, subcontracts, markups and margins, estimating, and service and maintenance contracts.

### **7156 Energy Management and Balancing 3**

Studies energy consumption (electricity, steam, gas, oil, coal) in buildings and methods of decreasing operational costs. Covers construction and insulation of systems, zoning and control, programmed night and off-time setback, control of exhaust fans and makeup air units, control of heating and air conditioning systems, types of heat reclamation units, and energy-saving exhaust hoods. Also covers overall energy control layouts and retrofitting of existing heating and air conditioning systems.

### **7157 Alternative Energy Fundamentals 3**

Studies the magnitude of energy available from the sun, various methods of collecting it, and the use and storage of energy for heating and cooling. Covers space heating and cooling, domestic and commercial hot water heating, and the heating of swimming pools. Students will design air and water systems and controls and determine the operational costs and savings.

### **7158 Absorption Air Condition Systems 3**

Studies the absorption cycle as used in cooling. Covers ammonia-water and lithium-bromide cycles, types, arrangements, parts, functions, and applications of units in air conditioning systems. Includes diagnosis of service problems.

### **7162 Specialized Environmental Systems 1 3**

Covers specialized environmental systems, including solar, electrohydraulic, heat conservation, heat recovery, and temperature and humidity control systems. Also includes heat pumps of all types.

### **7163 Air Distribution System Design 3**

Demonstrates methods used to size ductwork for residential applications. Students will make working drawings of various types of duct systems.

### **7164 Specialized Environmental Systems 2 3**

Studies pneumatic and other control systems.

### **7165 Advanced Electrical/Electronic Controls 1 3**

Studies more complex control systems than those found in average residential or single-zone commercial installations. Includes study of electronic and solid-state controls, zoning control, modulating controls used in larger systems, refrigerant flow, low-ambient controls, heat recovery, and economizer control arrangements.

**7168 Advanced Alternative Energy****3**

Studies solar, geothermal, photovoltaic, and sea energies, wind power, uses of methane and alcohol, and the recycling of wastes. Also covers the design and control of energy systems.

**7169 Advanced Electrical/Electronic Controls 2****3**

Offers further study of complex control systems. Covers electronic and solid-state controls, zoning control, modulating controls used in larger systems, refrigerant flow, low-ambient controls, heat recovery, and economizer control arrangements.

**7174 Service Organization and Management****3**

Studies the operation of a service department, including taking service calls and dispatching servicemen, personnel recruitment and training, truck maintenance, stocking and routing of trucks, handling of service tickets, pricing procedures, collection practices, warranty parts and procedures, service department overhead, customer relations, advertising costs, and service contracts.

**7175 Equipment Sales****3**

Studies sales engineering as a profession. Covers sales techniques and procedures, the role of manufacturers' representatives, marketing through written quotations and proposals, the formulation and writing of service contracts, and compensation plans for salesmen.

**7176 Applied Design****4**

Studies complete air conditioning systems through analysis of a given job. Includes calculation of heat losses and gains, selection of equipment and layout distribution systems, preparation of working drawings, and determination of operating and maintenance costs. Covers design and sizing of refrigerant piping, cooling tower piping, and chilled water-hot water piping.

**7180 Basic Residential Electrical Wiring****3**

Introduces fundamentals of residential wiring and circuitry, with special emphasis on service entrance requirements for all types of heating and air conditioning equipment.

**7181 Advanced Residential Electrical Wiring****3**

Focuses on upgrading and problem-solving in installations of heating and air conditioning equipment. Attention is given to repair and/or improvement of existing systems and to new installations in new or existing structures.

**7310 General Print Reading****4**

Covers fundamental working, drawing used in the trades and crafts. Emphasizes recognition of various types of working, drawings and developing interpretation skills.

**7331 Industrial Machine Electrical Circuits****3**

Studies fundamental single- and 3-phase alternating current, including parallel circuits, resistance, inductance, switching, fusing, current requirements, transformer

applications, and motors and motor control as applied to machinery diagrams. Discusses design, wiring techniques, and fabrication of wiring for machines.

### **7339 Machine Diagnosis and Repair - Electrical 3**

Instructs in troubleshooting of electrical control circuits, with emphasis on quick location of the defective circuit section and component. Covers relays, heaters, motor control switches, and timers.

### **7340 Machine Diagnosis and Repair - Mechanical 3**

Develops skills in the production of new and reconditioned mechanical parts for machines under repair. Presents techniques for calibration and repair of electro-mechanical devices, and offers practice in computations pertaining to industrial machinery. Also includes techniques related to gearing and use of lead-screws, ways, couplings, bearings, dovetails, and clutches. Emphasis is placed on safety.

### **7341 Hydraulic and Pneumatic Principles 3**

Covers principles and functions of fluid power and components. Includes study of terminology and the use and repair of equipment.

### **7342 Hydraulic and Pneumatic Systems and Repair 3**

Studies hydraulic and pneumatic systems design and the use of tools in repairing and troubleshooting hydraulic and pneumatic systems. Covers hydraulic and pneumatic valves, oils, gauges, fittings, hoses, and other components.

### **7343 Preventive Maintenance 3**

Stresses the importance of preventive maintenance for industrial equipment. Covers lubrication, maintenance procedures, and inspection records. Studies the effects of temperature, moisture, and corrosion on stored parts and the effects of speeds, feeds, machine loads, and gearing on machine performance.

### **7344 Power Plant Mechanics 1 3**

Offers specialized study in power plant mechanics for qualified students.

### **7345 Power Plant Mechanics 2 3**

Offers advanced study in power plant mechanics for qualified students.

### **7346 Industrial Instrumentation 1 3**

Studies the purpose, function, and applications of industrial instrumentation systems. Attention is given to temperature and pressure measurement, flow meters, controllers, transmitters, regulators, and quality control.

### **7347 Industrial Instrumentation 2 3**

Offers further study in the function and applications of industrial instrumentation systems. Covers temperature and pressure measurement, flow meters, controllers, transmitters, regulators, and quality control.

**7348 Millwright 1****4**

Introduces hand and power tools and measuring instruments used in carpentry, rigging, and machine and general shop work.

**7349 Millwright Shop 1****3**

Develops proficiency in the use of the trade tools and measuring instruments introduced in Millwright 1 (7348) through work assignments on general shop, machinist, carpentry, rigging, and equipment installation projects.

**7350 Millwright 2****4**

Introduces machinery and related equipment, including drive components, bearings, pumps, packing and seals, turbines, air compressors, boilers, and mechanical fasteners. Attention is given to the selection and use of lubricants.

**7351 Millwright Shop 2****3**

Applies mechanical principles to the assembly and disassembly of mechanical equipment, including drive components, bearings, pumps, packing and seals, air compressors, turbines, and other auxiliary equipment. Emphasizes use of maintenance manuals.

**7352 Troubleshooting Skills****3**

Introduces systematic and logical approaches to troubleshooting. Demonstrates procedures for both scheduled and unscheduled maintenance.

**7353 Cleaning Maintenance****3**

Instructs in the selection and use of cleaning materials and equipment, sanitation procedures, and safety practices for the maintenance of buildings.

**7356 Millwright Laboratory 3****2**

Offers further experience in applications of mechanical principles to assembly and disassembly of mechanical equipment, including drive components, bearings, pumps, packing and seals, air compressors, turbines, and other auxiliary equipment. Emphasis on use of shop manuals.

**7357 Millwright Laboratory 4****2**

Offers further experience in applications of mechanical principles to assembly and disassembly of mechanical equipment, including drive components, bearings, pumps, packing and seals, air compressors, turbines, and other auxiliary equipment.

**7358 Power Plant Maintenance 1****3**

Introduces power plant fundamentals, including use of hand tools, portable power tools, and stationary shop equipment; basic oxyacetylene processes; rigging and lifting; lubrication; measurements; blueprint- reading; preventive maintenance; caution and hold card procedures; dismantling and reassembly; cleaning; and painting. Emphasis is placed on safe use of equipment.

- 7359 Power Plant Maintenance 2** **3**  
 Offers further instruction in power plant fundamentals, including use of hand tools, portable power tools, and stationary shop equipment, basic oxyacetylene processes; rigging and lifting; lubrication; measurements, blueprint-reading; preventive maintenance; caution and hold card procedures; dismantling and reassembly; cleaning; and painting. Emphasis is placed on safe use of equipment.
- 7366 Automated Manufacturing Processes** **4**  
 Introduces automated manufacturing processes used in industry. Studies productivity, numerical control systems, (NC) computer- aided design (CAD) systems, and computer-aided manufacturing (CAM) systems.
- 7367 Programmable Controllers 1** **3**  
 Introduces the theory and operation of programmable controllers.
- 7368 Programmable Controllers 2** **3**  
 Provides further study in the theory and operation of programmable controllers. Emphasizes programming language, installation, maintenance, and applications.
- 7369 Industrial Microprocessor Applications** **3**  
 Introduces applications of microprocessors in industry.
- 7371 Industrial Digital Principles** **3**  
 Studies logic symbols and diagrams used in industry. Emphasizes comparison of logic circuits and their relay or line diagram equivalents.
- 7372 Industrial Digital Applications** **3**  
 Studies solid state and logic devices used to replace and enhance traditional industrial equipment. Includes evaluation of both static and dynamic systems and their uses.
- 7375 Utilities Distribution Systems** **4**  
 Introduces the student to common industrial and residential utilities distribution systems with emphasis on maintenance of these systems and safety precautions associated with these systems as well as local code requirements. Opportunity will be given to trace incoming utilities from their source to their end uses.
- 7380 Advanced Hydraulics** **6**  
 Studies hydraulic pumps, actuators, and components, with emphasis on troubleshooting, service, and repair.
- 7381 Equipment Installation and Rigging** **3**  
 Demonstrates procedures for leveling and aligning equipment and methods and tools for moving equipment of various sizes and shapes. Includes formulas for calculating mechanical advantages and safe working loads for ropes, blocks and tackles, and slings. Also demonstrates use of ladders, scaffolds, safety belts, and life nets for use in maintenance work at various heights.

**7382 Piping Systems 2**

Studies the construction, components, and uses of piping systems, with attention to the characteristics of piping materials and the behavior of fluids in a line. Emphasis is placed on the maintenance of piping systems.

**7383 Lubrication 2**

Defines lubricants and presents principles and practices of lubrication. Stresses the effectiveness of lubrication in reducing equipment downtime and repair.

**7384 Bearings 3**

Studies procedures for the removal, repair, and installation of bearings. Emphasis is placed on preventive maintenance.

**7385 Drive Components 3**

Studies the uses, functions, construction, and operation of drive components. Demonstrates methods of installation, lubrication practices, and maintenance procedures.

**7386 Air Compressors 3**

Studies pneumatic (compressed air) principles and systems. Examines how pneumatic power is produced, used, and controlled.

**7387 Pumps 3**

Studies the construction and operation of centrifugal, reciprocating, and rotary pumps and their components. Includes procedures for troubleshooting, installation, and maintenance.

**7390 Instrumentation Calibrations 3**

Studies manufacturers' techniques for calibrating electronic and pneumatic transmitters, controllers, recording valves, and valve positioners. Includes teardown, assembly, alignment, and calibration of equipment.

**7391 Measurements and Calibrations 3**

Studies electronic test instruments and how to use them. Emphasis is placed on accuracy and limitation of measurement and calibration methods in accordance with ASA and API standards.

**7392 Flow Measurements and Calibrations 3**

Studies practical methods of flow measurement and integration, stressing orifice selection and calculation methods in accordance with ASA and API standards.

**7510 Basic Drafting 3**

Introduces drafting equipment, lettering techniques, sketching, basic dimensioning, scale reading, and geometric construction.



**7511 Intermediate Drafting 3**

Presents isometric, oblique, and perspective projection techniques, auxiliary views, sections, and precision dimensioning and tolerance.

**7520 Descriptive Geometry 3**

Studies graphic solution of engineering problems, such as true length, piercing points of a plane, line intersections, revolutions, and developments.

**7521 Industrial Processes and Systems 3**

Studies manufacturing processes and equipment selection, use of modern machine tools, methods of fabrication, welding, electroforming, metallic coating, anodizing, plating, machine tool numerical control, and hydraulic systems as used in industry.

**7522 Production Drawing 3**

Studies working drawings, detail and assembly drawings, use of handbook data, developments, and intersections, with emphasis on thread fasteners, springs, and weldments.

**7523 Dimensioning Fundamentals 4**

Introduces dimensioning fundamentals and practices, with attention to size, location, and placement. Emphasis is placed on dimensioning notation.

**7525 Printed Circuit Design 3**

Introduces electrical and electronic terms and applications, schematic diagrams, board layout of components, manufacture of printed circuit boards, and art master tape-up operations.

**7528 Drafting for Heating and Air Conditioning 3**

Studies lettering, linework, isometric drawing, and layout of ducts, electrical controls, and pipes.

**7529 Drafting for Machine Tool 3**

Studies lettering, isometric drawing, orthographic projection, sectioning, dimensioning, and numerical control.

**7530 Product Drafting 1 3**

Studies detail and assembly drawings, stock lists, springs, weldments, and catalog items.

**7531 Mechanisms and Machines 3**

Studies machines and their elements, including shafts, bearings, keys, pins, springs, clutches, brakes, and pressure cylinders, in a simulated industrial environment. Includes study of displacement velocity and acceleration, the geometry of involute gears, and the properties of standard spurs and helical, bevel, and planetary gears. Also includes analysis of linkages, cams, and gears.

**7532 Tool Drafting 3**

Studies the detailing of metal cutting tools, jigs, fixtures, gauges, and other tools used in manufacturing processes.

**7533 Die Design 3**

Studies the planning and detailing of blank, piercing, and forming dies. Attention given also to plastic mold and die casting.

**7540 Product Design Drafting 3**

Studies design of consumer products, with attention to function, sales appeal, and cost.

**7541 Advanced Tool and Gauge Design Drafting 3**

Studies the design of jigs, fixtures, cutting tools, tool holders, and gauges for an existing product, with attention to standards and former designs.

**7543 Technical Illustration 3**

Introduces three-dimensional drawing methods and rendering techniques, with emphasis on the use of templates. Also presents isometric drawing, measuring in isometric, line, and plane positions, and use of reference lines and points.

**7545 Product Drafting 2 3**

Studies the development, design, and manufacturing of consumable and depreciable items, with special attention to the use of standard catalog sizes and equipment.

**7547 Electronic Drafting 3**

Studies the diagramming of electronic circuits and systems, with emphasis on drawing and interpretation of diagrams and electrical blueprints.

**7548 Basic Geometric Dimensioning and Tolerancing 3**

Introduces principles and techniques of geometric dimensioning and tolerancing (GDT). Attention is given to engineering, design, drawing, specifications, function, and interrelationship of parts.

**7550 Gear and Cam Design Drafting 3**

Presents cam design and principles governing the conversion of rotary motion into linear. Includes detailed study of types and functions of gears, power transmission and speed, and mechanical advantage.

**7551 Statics 3**

Covers theory and applications of engineering mechanics; fundamental quantities, units, force, and position vectors; equilibrium of a particle; equivalent force systems; equilibrium of a rigid body; structural analysis; internal forces; center of gravity and centroids; moment of inertia for an area, radius of gyration; and section modules.

**7552 Strength of Materials 3**

Studies various types of stresses and strains, modules of elasticity, shear and

bending diagrams, bending and deflection, and safe loading capacities of structural members under working loads.

### **7553 Advanced Die Design Drafting 3**

Studies the design and drafting of piercing and forming dies, using standards and handbook data. Includes procedures for blanking, progressive, compound, piece-part-form-bend, and draw dies.

### **7555 Mold Design Drafting 3**

Studies the design and construction of molds commonly used in mass production, with attention to product shape.

### **7556 Cutting Tool Design Drafting 3**

Deals with the design of single- and multiple-point cutting tools. Includes metal-urgy as it relates to the design and use of metal-cutting tools.

### **7557 Jig and Fixture Design 3**

Studies the design of jigs and fixtures commonly used in industry, with attention to assembly detailing procedures. Covers theory of gauging; terminology, including ring, snap, flush, pin, thread, indicator, and location gates; and dimensioning and tolerancing of gauges.

### **7558 Sheet Metal Drafting Project 3**

Studies fundamentals of sheet metal work as applied to design and layout of sheet metal forms. Discusses layout problems in ductwork design.

### **7559 Route Surveying 4**

Studies theories and problems of route surveying, including horizontal and vertical curve, data, and design; highway and railroad layouts, and superelevation and earthwork calculations.

### **7560 Machine Design Drafting 2**

Studies the design of automated machines and production tools actuated and controlled by hydraulics and pneumatics.

### **7561 Advanced Surveying Field Problems 3**

Offers field exercise in route surveying, including curve layout, setting elevations, horizontal and vertical controls, and earthwork data.

### **7562 Advanced Mold Design 3**

Introduces plastics and plastics manufacturing processes, with emphasis on design of plastics for industry. Special attention is given to injection, transfer, compression, and extrusion molding.

### **7563 Advanced Jig and Fixture Design Drafting 3**

Studies design of various types of jigs and fixtures, with emphasis on theory of locating and clamping parts for machining.

**7565 Metallurgy Fundamentals****2**

Presents fundamentals of thermodynamics and reactions occurring in metals subjected to heat treatment. Includes chemical and physical metallurgy, classification and properties of metals, theory of alloys, heat treatment for steels, special steels and cast iron, and powder metallurgy.

**7571 Industrial Planning and Estimating****3**

Studies recognized tests, techniques, and applications of value measurement used to eliminate unnecessary costs in design, development, manufacturing, engineering research, industrial engineering, materials management, process and product control, and facilities planning. Attention is given also to estimation practices related to manufacturing.

**7572 Industrial Design Product Drafting****6**

Studies design of consumer products and its applications. Considers function, sales, appeal, and cost.

**7573 Industrial Design Presentation****3**

Applies acquired skills in product drafting to the design of a new or existing consumer product. Consideration is given to function, esthetics, costs, and marketability of the product.

**7574 Industrial Design Detailing****3**

Provides opportunity for the student to design, develop, and prepare a product for production. Emphasis is placed on detailed working drawings and a final assembly drawing.

**7575 Numerical Control and Data Processing****3**

Introduces automatic process control and the fundamentals of feedback, transmission, control action, and controlling elements as used in pneumatic, hydraulic and electrical systems. Special attention is given to the relationship between digital devices and the automatic process control system.

**7576 Manufacturing Planning and Estimating****4**

Studies methods of testing and measuring value to eliminate unnecessary costs in design, development, manufacturing, engineering, and research. Gives attention to industrial engineering research, materials management, process and product control, facilities planning, plant engineering, and manufacturing information systems. Demonstrates industrial use of time and motion studies to determine rates.

**7577 Design Problems****4**

Applies acquired knowledge and skills to the design of complete machines or subassemblies of machines.

**7578 Piping Fundamentals****3**

Surveys residential and industrial plumbing practices and requirements.

**7579 Basic Structures/Industrial Drafting****3**

Studies structural systems and the forces that act upon them. Attention is given to static and dynamic loads.

**7581 Drafting Fundamentals****6**

Teaches the use and care of drafting equipment, techniques of lettering, sketching, dimensioning, scale-reading, and geometric construction. Studies techniques of isometric, oblique, and perspective projections, auxiliary views, sections, and tolerances.

**7590 Computer Graphics****4**

Explores the field of computer graphics, including technical graphics, orthographic multiview drawings, pictorial drawings, charts, graphs, sheet metal sketch-outs, and schematics. The student will write graphics programs and work directly with graphics input and output devices.

**7592 Blueprint Reading for Drafting 1****4**

Develops blueprint reading skills for the draftsman.

**7610 Mining Fundamentals****5**

Introduces fundamentals of mining, with emphasis on management and safety. Attention is given to geological factors affecting mineral formation, U.S. mineral resources, and methods of mining. Includes a tour of surface mines in the local area.

**7611 General Physical Geology****5**

Introduces fundamentals of geology and the geological history of North America, with emphasis on the Mississippian and Pennsylvanian periods. Studies sediments and sedimentary rocks, especially those allied with coal beds. Includes field trips in the local area.

**7612 Surface Mining Machinery****4**

Studies concepts and operating principles of all types of surface mining machinery. Course includes student reports of visits to area mines, with special attention given to structural defects, safe operation and maintenance of mines, operator training and skills, and life expectancy of workers.

**7621 Mine Maps and Surveying****3**

Demonstrates the use of mine maps and surveying techniques applicable to mining. Includes taping, profile leveling, cross-sections, earthwork computations, and transit stadia and transit-tapes surveys.

**7622 Mine Maps and Surveying Laboratory****2**

Offers laboratory experience in the use of mine maps and surveying techniques applicable to mining. Includes taping, profile leveling, cross-sections, earthwork computations, and transit stadia and transit-tapes surveys.

**7623 Elements of Reclamation****4**

Studies land reclamation as it pertains to the surface mining industry. Covers basics of reforestation and reviews the types of grasses and legumes found in different geographical areas. Examines existing federal and state regulations and future possibilities and trends. Emphasizes the importance of production and reclamation as a working unit.

**7625 Surface Mining Field Study 1****6**

Provides opportunities for field projects in surface mining, in compliance with the Cooperative Education policies defined in course listing 8501. The student's project will include data collection and analysis and actual work experience.

**7626 Surface Mining Field Study 2****6**

Provides further opportunities for field projects in surface mining, in compliance with the Cooperative Education policies defined in course listing 8501. The student's project will include data collection and analysis and actual work experience.

**7631 Elements of Spoil Management****4**

Studies the principles of spoil control, with emphasis on planning, use, and management of spoil materials. Includes principles of vegetative survival, deposition of overburden, and slope control.

**7632 Equipment Operations Laboratory 1****4**

Studies practices and devices pertaining to the extraction of overburden and the transportation of coal. Attention is given to equipment used in drainage and to electric, hydraulic, and compressed air power and coal preparation machinery.

**7633 Welding Principles****4**

Demonstrates the use of oxyacetylene and electric arc welding equipment. Offers practical experience in cutting, bronze welding, fusion welding, and hard-facing with oxyacetylene flame.

**7640 Blasting and Explosives****5**

Instructs in the care and use of explosives, with emphasis on the mandatory standards.

**7641 Operation Safety and Accident Prevention****4**

Presents information and skills useful in public relations and safety education. Develops speaking, listening, and writing skills; introduces use of the Bureau of Mines Dictionary of Mines; instructs in the use of safety films; and reviews wage agreements, forms, and reports required by government agencies.

**7642 Electrical Circuits and Systems****4**

Introduces principles of electricity pertaining to machine operation. Includes conductors and conductor sizes, magnetic circuits, coil polarities, and AC and DC motors.

## **7643 Economics of Mining and Cost Calculation 4**

Studies the evolution of rules and regulations significant to the production and use of minerals to effect a reasonable profit margin. Discusses taxation, depreciation and depletion allowances, and foreign competition and interstate commerce regulations.

## **7644 Equipment Operations Laboratory 2**

Offers practical experience in handling equipment pertaining to the extraction of overburden and the transportation of coal. Includes equipment used in drainage and electric, hydraulic, and compressed air power and coal preparation machinery.

## **7645 Surface Mining Field Study 3 6**

Provides opportunities for extended practice and skill development in specified areas of surface mining.

## **7646 Surface Mining Field Study 4 6**

Provides further opportunities for extended practice and skill development in specified areas of surface mining.

## **7650 Coal Preparation Plants 2**

Studies the purposes and processes of coal preparation plants. Attention is given to raw coal, disposal of refuse and slurry, and coal storage, loading, and mechanics.

## **7651 Coal Sampling and Analysis 3**

Provides limited laboratory training in approved methods of coal analysis, with emphasis on the Bureau of Mines safety requirements.

## **7652 Labor Relations 3**

Studies labor and management approaches to the operation of mines. Emphasis is placed on proper and ethical procedures.

## **7653 Transmission Systems 4**

Studies applications of gears and gear drives and mechanical advantage in coal transportation systems, including truck, rail, slurry, and conveyor belt.

## **7654 Mine Operation Planning 4**

Studies effective planning in daily and long-range mining operations.

## **7660 First Aid and Safety Management 4**

Studies first aid, dust and noise evaluation, gas detection, safe and unsafe practices, accident reduction, emergency aid for the injured, mine rescue operations, safety duties of mine personnel, and instructor training and certification by the Mine Safety and Health Administration.

## **7662 Coal Mine Supervision 5**

Introduces coal mine management and supervisory obligations. Attention is given to motivation, employee relations, and management by objectives.

## **7663 Water Drainage and Water Pollution Laws 5**

Studies laws and problems pertaining to the control of water in mining operations. Covers slurry ponds, pit drainage, and acid seepage, with emphasis on federal EPA regulations.

## **7710 Machine Tool Introduction 3**

Studies machine tool processes and the care and use of hand tools and measuring devices. Emphasis is placed on basic drawing, print-reading, and lab safety features.

## **7711 Machining Fundamentals 1 3**

Develops bench work, sawing, filing, layout, drilling, and reaming skills in the completion of student projects. Offers experience in communications and applied mathematics.

## **7712 Machining Fundamentals 2 3**

Introduces use of lathes, milling machines, shapers, and drill presses in project assignments.

## **7714 Basic Drilling Operations 5**

Introduces drilling setups and operations, including work-holding devices, speeds, feeds, thread tops, and tapping techniques.

## **7715 Basic Milling Operations 5**

Introduces milling machinery operations, with focus on speeds and feeds for both vertical and horizontal machines. Includes use of work-holding fixtures and bandsaws, blueprint-reading, precision measurement, and safety precautions.

## **7716 Production Machining 1 5**

Introduces production machining fixtures and processes and basic production gauging.

## **7717 Production Machining 2 5**

Introduces production machines used by metal-turning operators, with emphasis on the turret lathe. Attention is given to single spindle screw machine operation.

## **7720 Machine Tool Processing 3**

Studies fundamental machine shop techniques, including threads and threading, sine bar applications, and dividing or indexing head.

## **7721 Machine Tool Setup and Operation 3**

Studies completed, hardened, and ground V-block internal and external threads. Attention is also given to use of the dividing head.

## **7724 Basic Grinding Operations 5**

Introduces surface grinding applications and skills. Projects include machining to precision tolerances and surface finishing.



- 7730 Advanced Machine Tool Processing** **3**  
 Studies advanced machine shop techniques. Introduces grinding procedures and operations.
- 7731 Basic Print Reading** **3**  
 Provides instruction in reading machine shop symbols, stock lists, and shop blueprints. Attention is given to dimension, shape, fabrication, and assembly. Applies basic mathematics in the solution of print and performance problems.
- 7733 Advanced Machine Tool Setup and Operation** **3**  
 Includes tool processing, surface and cylindrical grinding, and applied mathematics.
- 7734 Advanced Print Reading** **3**  
 Applies mathematics in solving shop problems related to die design and fabrication, special machinery, and die casting. Covers assembly, interpretation of drawings, and sketching without shop instruments.
- 7736 Advanced Mill Operations** **5**  
 Introduces plunge, step, and angle milling operations and establishes dimensional tolerances. The student will machine a project to function upon assembly.
- 7739 Basic Lathe Operations** **5**  
 Introduces engine lathe operations and systems. Demonstrates speeds and feeds, devices, dimensional tolerances, and finishes.
- 7740 Specialized Machining Theory** **3**  
 Introduces jig boring and grinding procedures, rotary table, tracing practices, and advanced machine tool processes in various areas. Includes assigned projects using specialized machine tools.
- 7741 Basic Metallurgy and Heat Treatment** **3**  
 Studies fundamentals of thermodynamics and reactions occurring in metals subjected to various kinds of heat treatment. Includes classification and properties of metals; chemical and physical metallurgy; theory of alloys; heat treatment principles as applied to ferrous and nonferrous materials; tests to determine uses; heat treatment for steels, special steels, and cast iron; powder metallurgy; use of gas and electric furnaces and their controls; applied mathematics; and communications skills.
- 7742 Specialized Machine Tool Application 1** **3**  
 Applies jig boring and grinding skills to advanced projects.
- 7743 Specialized Machine Tool Application 2** **3**  
 Applies knowledge of differential indexing, gear cutting, cam milling, and tracer design to student projects.

- 7744 Machinery Handbook 1** **3**  
 Studies the intent and use of the Machinery Handbook.
- 7745 Machinery Handbook 2** **3**  
 Applies principles and concepts contained in the Machinery Handbook to projects in the machine tool program.
- 7747 Advanced Lathe Operations** **5**  
 Demonstrates how to machine a thread on the lathe, work with tapers machined by various methods, and operate a turret lathe.
- 7750 Tool Fabrication 1** **3**  
 Studies tool design, assembly, and standards, with emphasis on the components and operations pertaining to blanking and piercing dies.
- 7751 Tool Fabrication 2** **3**  
 Concentrates on progressive dies and the transfer of motion and force. Develops skills in fabrication and design through assigned projects.
- 7752 Mechanism Design 1** **3**  
 Studies mechanical movements and mechanisms. Attention is given to the complexity and feasibility of incorporating different kinds of movements into working mechanisms.
- 7753 Mechanism Design 2** **3**  
 Provides opportunity for the student to complete a working drawing of a mechanism from a sketch, using accepted drafting standards and practices.
- 7756 Tool Fabrication 3** **3**  
 Demonstrates use of precision fits and alignment of mating parts in the construction of a working mechanism. The student will assemble a mechanism to perform a designated function.
- 7758 Numerical Control and Automatic Processing 1** **3**  
 Introduces fundamentals of automatic process control, including feedback elements, transmission, control action, and controlling elements as used in pneumatic, hydraulic, and electrical systems. Emphasis is placed on the relationship between digital devices and automatic process control systems.
- 7759 Numerical Control and Automatic Processing 2** **3**  
 Provides further study of automatic process control, including feedback elements, transmission, control action, and controlling elements as used in pneumatic, hydraulic, and electrical systems.
- 7760 Numerical Control and Automatic Processing 3** **3**  
 Introduces computer-aided numerical control programming, using sixteen vocab-

ulary usages and their results. Demonstrates preparation of a manuscript for a numerical control program. Explains cutter location computer file data and how it is used.

### **7761 Plastics Molding and Die Casting Fundamentals 3**

Studies the materials and processes used in plastics and die casting, including mold and die tools, plastic and die casting composition, basic injection mold and die cast design, and machines and methods used to produce specific products. Emphasis is placed on injection molding and die casting methods.

### **7762 Precision Measurement 3**

Demonstrates techniques of linear and angular measurement, methods of application, and uses of precision measurements in machine tool production and quality control.

### **7763 Grinding Technology 1 3**

Develops proficiency in industrial grinding, including contour and radius grinding. Covers identification of abrasives and the structure, care, and use of grinding wheels.

### **7764 Layout and Inspection 3**

Studies layout materials and instruments, with attention to interchange ability and inspection procedures.

### **7765 Grinding Technology 2 3**

Develops proficiency in industrial grinding, including contour and radius grinding. Covers identification of abrasives and the structure, care, and use of grinding wheels.

### **7766 Screw Machine Operator - Setup 1 3**

Offers basic training in multiple spindle screw machine operation.

### **7767 Screw Machine Operator - Setup 2 3**

Offers intermediate training in multiple spindle screw machine operation.

### **7769 Numerical Control and Automatic Processing 4 3**

Provides further study in computer-aided numerical control programming.

### **7772 Advanced Grinding Operations 5**

Studies production grinding, including ID and OD grinding, surface grinding, and cut-off operations. Also studies surface finishes and the mounting, balancing, and dressing of various types of grinding wheels.

### **7775 Jig and Fixture Concepts and Design 4**

Presents skills used in production machining. Includes mechanical drafting, blueprint reading, and mechanical drawing.

### **7791 Machine Reconditioning and Repair 1 5**

Includes disassembly, inspection, and reconditioning of machine components, with emphasis on machine installation and drive system repairs. Offers opportunity for

the student to utilize prior machine tool competencies, such as milling, drilling, turning, threading, boring, grinding, scraping, and welding, in restoring worn and damaged machines to serviceable condition.

**7801 Introduction to Plastics****3**

Introduces the plastic extrusion process, including the extruder, cooling, sizing, and cutting equipment. Demonstrates numerous sizing techniques required for producing various plastic products.

**7802 Plastic Extrusion****3**

Develops skills in tool and machine setup and parts production, using plastic extrusion processes with various materials.

**7803 Plastic Injection Molding****3**

Introduces the injection molding process, including mold setup, material handling, drying, job setup, and production of usable parts.

**7804 Plastic Materials****3**

Covers the properties, peculiarities, and applications of commercial polymers. Includes identification techniques and testing methods.

**7805 Low-Pressure Tooling****3**

Trains the student to identify, evaluate, select, and use materials employed in low-pressure tool making. Attention is given to jigs and fixtures and cast, sheet metal, and aluminum tools. Coursework includes construction of a production mold, using one of several processes—wood, plaster, plastic, or rubber tooling—covered in the course. The tool built in the course will be used for molding parts in other plastics courses.

**7806 Thermoplastic Processes - General****3**

Presents blow molding, thermoforming, and casting. Students will produce parts from several materials using all three processes.

**7807 Plastics Quality Control****3**

Includes testing of incoming polymers, reading piece part blueprints, and controlling outgoing quality. Attention is also given to sampling, confidence levels, and statistical methods used by the federal government and automotive companies.

**7808 High Pressure Tooling****3**

Covers preventive maintenance of tools, assembly and disassembly, interlocks, gate sizing, and other aspects of high pressure tooling under the control of production personnel.

**7809 Fiber-Reinforced Plastics****3**

Studies principles, processes, and techniques related to the production of fiber-reinforced plastics.

### **7810 Plastics Manufacturing Technology 3**

Demonstrates the injection molding process, including solid state and electro-mechanical systems. Emphasis is placed on machinery troubleshooting.

### **7811 Plastic Manufacturing Technology 3**

Provides training in the handling of plastics materials in a production environment.

### **7813 Thermoset Plastic Materials and Processes 3**

Studies volume thermosetting resins and the processes of production. Includes compression and transfer molding, injection molding, laminating, and casting.

### **7913 Environmental Control 4**

Surveys the problems of pollution pertaining to water, air, population, solid waste, radiation, and noise. Examines human impact on the environment and the global dilemma confronting all mankind.

### **7915 Applied Chemistry 1 3**

Offers laboratory training in various types of chemical analysis used in water testing to comply with state and federal wastewater effluent standards.

### **7916 Environmental Seminar 1**

Develops environmental awareness through intensive monitoring of all communications media. Includes presentation of papers and group discussions.

### **7926 Applied Chemistry 2 3**

Consists of intensive laboratory training in the types of chemical analysis used in water testing to comply with state and federal water quality standards. Studies theories and laboratory techniques for determining alkalinity, hardness, turbidity, and acidity, and for measuring levels of nitrates, ammonia, phosphates, grease and oil, cyanide, and phenols.

### **7934 Basic Hydraulics 4**

Presents engineering fundamentals pertaining to water supply and distribution, wastewater collection, and removal and disposal. Introduces study of closed conduit and open channel flow, stream flow, runoff, and characteristics of pumps.

### **7942 Applied Microbiology 3**

Provides laboratory training in applied water and wastewater microbiology and in the microbiology of milk and food. Attention is given to total and fecal coliform, total plate count, and milk and food inspection.

### **7943 Water Supply and Treatment 4**

Studies principles and methods of water purification, including coagulation, sedimentation, chlorination, treatment chemicals, taste and odor control, bacteriological and mineral control, design criteria, and maintenance and operational programs. Examines new processes and recent developments.

**7945 Equipment and Maintenance 1****3**

Presents fundamentals of electricity and electronics, the use and maintenance of laboratory equipment, instrumentation, and electrical systems and motors, with emphasis on troubleshooting and safety.

**7946 Applied Research 1****2**

Provides opportunity for the student to research an area of special interest within the field of air or water pollution.

**7951 Reporting and Purchasing****2**

Studies recordkeeping, reporting, and purchasing practices relevant to efficient operation of an air or water pollution control facility.

**7954 Plant Operations 1 - Municipal****4**

Considers aspects of design, operation, and maintenance of wastewater treatment plants from an engineering viewpoint. Studies design parameters for all processes, the materials used and their purposes, types and operation of equipment, maintenance of plant and equipment, and solutions to common operational problems.

**7955 Management and Supervision Procedures****3**

Develops understanding and skills in the area of human motivation and behavior, with emphasis on methods of improving attitudes, productivity, and morale in working situations. Covers hiring, orientation, and dismissal of employees; handling of emergencies; maintaining operational control; and aspects of public relations and image development.

**7956 Applied Research 2****3**

Provides opportunity for the student to research an area of interest within the field of air or water pollution. The student will present a paper on the research results at the conclusion of the study.

**7957 Community Sanitations****3**

Introduces public health protection and promotion of human comfort and well-being through control of the environment. Covers communicable diseases, solid wastes disposal, milk and food sanitation, disinfectants and insecticides, insect vector and rodent control, institutional sanitation, and occupational health.

**7958 Equipment and Maintenance 2****3**

Offers instruction and experience in the maintenance of mechanical equipment, including pumps, valves, blowers, lift stations, and feed systems. Attention is given also to the maintenance of plant grounds, buildings, and tanks. Emphasis is placed on proper attitudes toward maintenance and maintenance programs.

**7959 Water Distribution****3**

Presents engineering fundamentals pertaining to water supply and distribution. Study includes pumping, storage, metering, pipe installation and maintenance, chlorine handling and safety, and public relations.

**7960 Air Pollution Control 1****4**

Studies fundamentals of air pollution control, including history and effects of air pollution, air pollutants and their sources, meteorology and air pollution, concepts of thermodynamics, air quality criteria, particulates, sulfur oxides, nitrogen oxides, hydrocarbons, photochemical oxidants, process types, industries and agencies, and the applicability of federal, state, and local regulations, inspection, and enforcement.

**7961 Plant Operations 2 - Municipal****3**

Provides advanced study of wastewater treatment processes, with emphasis on ammonia and phosphorus removal, carbon absorption, filtration, disinfection, and coagulation.

**7963 Plant Operations 3 - Industrial****3**

Studies the special problems of industrial wastewater treatment, with emphasis on the major classifications of liquid industrial wastes. Includes neutralization, equalization, proportioning, and removal of troublesome solids. Also covers cyanide and chromium treatment.

**7964 Plant Mathematics****4**

Addresses problems of wastewater processing and process control. Instructs in laboratory and efficiency calculations, with special emphasis on treatment plant calculations and mathematical skills.

**7966 Hazardous Materials****2**

Studies explosive, combustible, corrosive, toxic, and radioactive substances in contemporary life. Examines the chemistry of new and dangerous products.

**7967 Occupational Orientation****2**

Introduces students to career opportunities in environmental fields by means of guest lectures, films, and media surveys. Heightens consciousness of environmental problems and issues through discussion and active involvement.

**7968 Maintenance of Collection Systems****4**

Studies purposes and methods of operation, maintenance, inspection, testing, cleaning, and repair of the sewer collection system. Special attention is given to the operation and maintenance of lift stations, and to safety and administrative record control.

**7969 Secondary Treatment Process Controls****3**

Studies in detail the controls and tests necessary for efficient operation in activated sludge, trickling filter, and other secondary wastewater processes.

**7970 Air Pollution Control 2****3**

Studies theory and laboratory techniques pertaining to ambient air quality and source sampling. Includes definition of air pollutants sources and occurrences, sample collection and equipment, maintenance of laboratory equipment, calculation and interpretation of results, and field trips.

**7972 Environmental Administration****4**

Studies decision-making structures of the private sector and federal, state, and local governments with reference to environmental issues. Introduces fundamentals of environmental law.

**7973 NPDES Workshop****2**

Provides intensive laboratory training in various chemical and biological analyses used to comply with state and federal water quality and effluent standards. Develops skills in conducting BOD, DO, chlorine residual, suspended solids, pH, fecal coliform, and flow measurement analyses. Attention is also given to the maintenance of equipment necessary for these analyses.

**7974 Phosphorus Removal Workshop****2**

Emphasizes the importance of phosphorus removal. Equips the student with skills to calculate the amount of chemicals needed, to monitor the point(s) of application of the chemicals, to evaluate the operating system, and to conduct tests indicating the efficiency of the system. Includes basic design considerations for removal systems, types of chemicals available for phosphorus removal, maintenance of equipment, and recordkeeping. Course is designed for operators and chemists of wastewater treatment plants requiring phosphorus removal at the present time or in the near future.

**7975 Basic Laboratory Skills****2**

Offers training and experience in the identification, care, and use of laboratory equipment and glassware, laboratory safety, sampling techniques, solutions and dilutions, ordering of supplies and equipment, and inventory maintenance.

**7976 Metal Analysis Workshop****2**

Offers intensive program in techniques of sampling and preservation of samples for metal analyses. Includes preparation of standard solutions, preparation of samples for analysis, and use of the atomic absorption spectrophotometer.

**8001 Gas Welding 1****3**

Offers instruction in oxyacetylene welding, including gas welding techniques, brazing, and flame cutting.

**8002 Gas Fusion and Brazing Shop****3**

Provides experience in oxyacetylene welding processes in all positions. Includes exercises in brazing and cutting.

**8003 Gas Welding 2****3**

Offers further instruction in oxyacetylene welding, including gas welding techniques, brazing, and flame cutting.

**8006 Basic Metallurgy****3**

Studies properties and uses of ferrous and nonferrous metals and alloys, production of iron and steel, composition and properties of plain carbon steel and alloying elements, selection of tools, case hardening, and destructive and nondestructive test-



ing. Includes fundamentals of heat treatment and reactions occurring in metals subjected to various heat-treatment methods and techniques.

### **8007 Basic Metallurgical Shop 2**

Provides practical experience in the use of various equipment for destructive and nondestructive testing. Also covers heat-treating principles and procedures related to welding applications.

### **8008 Gas Welding 3 2**

Offers further instruction and skill development in oxyacetylene welding, including gas welding techniques, brazing, and flame cutting.

### **8010 Arc Welding 1 3**

Demonstrates the welding of ferrous metals and alloys using shielded metal arc methods, single and multipass techniques, and flat and horizontal positions. Emphasis is placed on safe practices.

### **8011 Arc Welding Shop 1 3**

Provides experience in welding in flat and horizontal positions on mild steel, using various electrodes.

### **8013 Blueprint Interpretation 3**

Studies interpretation of blueprints pertaining to the welding trade. Attention given to metal structures, specifications and assembly drawings, special forms of dimensioning, and section views.

### **8015 Arc Welding 3 2**

Introduces welding in vertical up and down positions.

### **8016 Arc Welding 4 3**

Studies welding of ferrous metals and alloys using electric arc methods, single and multipass techniques, and vertical and overhead welding positions.

### **8021 Arc Welding - Shop 3**

Provides experience in advanced welding techniques, including vertical and overhead positions, single and multipass welds, and use of various types and sizes of electrodes.

### **8022 Electrical Fundamentals 3**

Studies the relationships of voltage, current, and resistance in electrical circuits, with emphasis on the production of heat from flow of current through resistance. Special attention is given to the use of high current transformers in AC circuits.

### **8024 Welding Blueprint Interpretation 3**

Presents advanced study of blueprint interpretation, concentrating on welding symbols and their significance in the welding trade. Includes process and finish symbols and methods of finish.

**8027 MIG 1****3**

Studies various gas metal arc welding (GMAW) processes, including microwire, flux core, innershield, and submerged arc, in all welding positions.

**8028 TIG 1****3**

Instructs in making welds in all welding positions on various thicknesses and types of metals. Provides practice in using the GMAW processes.

**8029 MIG 2****2**

Offers extensive welding experience using the metal inert gas welding (MIG) process. Instructs in making welds in all welding positions on various thicknesses of metal.

**8031 Gas Tungsten Arc Welding (GTAW) - Lecture****4**

Provides a thorough grounding in the welding processes, with emphasis on gas tungsten arc welding. Offers detailed study of the techniques of making welds in all positions using the GTAW applications. Lectures and discussions provide background essential to the qualified GTAW welder.

**8033 TIG Lab****2**

Offers extensive welding practice using the gas tungsten arc welding process. Students make welds on various thicknesses and types of metal, using all welding positions.

**8034 TIG 2****2**

Offers extensive welding experience using the gas tungsten arc welding process. The student will learn to make welds on various types and thicknesses of metal using all welding positions.

**8035 Basic Fabrication 1****3**

Presents principles of layout and measurement pertaining to the fabrication of metal products. Discusses tolerances, fits, and allowances.

**8036 Basic Fabrication 2****2**

Provides opportunities for individual construction projects, using metal and other materials.

**8037 Basic Mine Welding 1****3**

Studies welding techniques and materials used in the mining industry, including welding with low hydrogen electrodes and flux-cored wire. Prepares the student for preemployment testing as administered at mining operations and on coal mine construction projects.

**8038 Basic Mine Welding 2****2**

Introduces all four welding positions and use of low hydrogen electrodes. Also introduces the flux-cored metal inert gas welding wire used in mining operations.

- 8040 Welding Equipment Maintenance** **3**  
 Studies theory of operation and construction of oxyacetylene and arc equipment. Discusses maintenance and troubleshooting of welding equipment.
- 8041 Welding Equipment Maintenance Shop** **1**  
 Offers experience in the maintenance and repair of oxyacetylene and arc welding equipment, including hoses and cables. Demonstrates the installation of replaceable working parts of oxyacetylene and electric arc welding equipment.
- 8042 Basic Fabrication - Class** **1**  
 Presents principles of layout and measurement pertaining to the fabrication of metal products. Discusses tolerances, fits, and allowances.
- 8044 Welding Equipment Maintenance - Inert Gas** **3**  
 Presents various welding processes, particularly tungsten inert gas and metal inert gas welding, with emphasis on welding techniques in all positions.
- 8048 Occupational Safety and Health Act (OSHA) for Welding** **3**  
 Studies the Occupational Safety and Health Act of 1970, with special attention to employer and employee rights and responsibilities, compliance with rules or standards, inspections by Compliance Safety and Health Officers, violations, citations, penalties, variances, appeals, record-keeping, and state and federal safety and health programs.
- 8049 Production and Resistance Welding - Class** **3**  
 Studies in depth the use of gas and arc welding in manufacturing and repetitive production operations. Emphasis is placed on pipe welding and resistance techniques.
- 8050 Production and Resistance Welding - Shop** **2**  
 Covers the welding of pipe in fixed horizontal and vertical positions. Also includes resistance, spot, and projection welding on various types and thicknesses of materials.
- 8055 Special Welding Processes** **4**  
 Offers advanced study of welding methods, processes, techniques, machines, and equipment.
- 8057 Plasma Arc Lab** **1**  
 Introduces plasma arc welding in flat and horizontal positions.
- 8058 Industrial Materials** **4**  
 Studies internal and external forces resulting in deformation of elastic bodies. Includes analysis of simple and combined stresses relative to the functioning properties of materials. Also includes laboratory experiments to determine the strength, hardness, and durability of common industrial materials.
- 8059 Welding Troubleshooting** **3**  
 Concentrates on the evaluation of weldments, welding procedures and tolerances, and joint design and alignment.

**8060 Welding Troubleshooting Inspection Shop****1**

Provides experience in visual destructive and nondestructive testing of weldments. Includes review of welding techniques.

**8061 Pipe Welding 1****5**

Presents techniques of welding pipe in horizontal, flat, vertical up, and overhead positions with shielded metal arc welding (SMAW) process. Includes electrodes, joint design, and fitup.

**8063 Electrical Fundamentals for Welding****3**

Studies the relationships of voltage, current, and resistance in electrical circuits, with emphasis on the production of heat from the flow of current through resistance. Special attention is given to the use of high current transformers in AC circuits.

**8064 Basic Metallurgy****3**

Studies properties and uses of ferrous and nonferrous metals and alloys, production of iron and steel, composition and properties of plain carbon steel and alloying elements, selection of tools, case hardening, and destructive and nondestructive testing. Includes fundamentals of heat treatment and reactions occurring in metals subjected to various heat-treatment methods and techniques.

**8065 Pipe Welding 2****5**

Provides further instruction in welding pipe in horizontal, flat, vertical up, and overhead positions with shielded metal arc welding (SMAW) process. Includes electrodes, joint design, and fit-up.

**8066 Introductory Welding (Non-Majors)****3**

Covers gas and arc applications for occasional users from other trade areas.

**8067 Welding Codes and Testing Operations****3**

Studies types of welding codes, testing operations, and procedure specifications. Attention is given to filler metals, positions, preheat and heat treatment, backing strips, preparation of base materials, cleaning, and defects.

**8068 Specifications and Estimating****2**

Offers instruction and experience in metal specifications and estimating. The student will prepare an estimate for a job, based on calculation of time and materials.

**8074 Shop Practices****4**

Presents the design, construction, theory of operation, diagnosis, troubleshooting, and maintenance of oxyacetylene gas and arc welding equipment. Emphasis is placed on the operation of gas metal arc (MIG) and gas tungsten arc (TIG) equipment.

**8075 Welding Fabrication 1****2**

Presents principles of layout, measurement, and joint designs used in the fabrication of steel and aluminum products. Students will construct individual and/or

group projects, giving attention to tolerances and fitup of metal products. Emphasis is placed on safe welding practices.

## **8076 Welding Fabrication 2 2**

Offers advanced study of layouts, measurements, and joint designs used in the fabrication of steel and aluminum products. Students will construct advanced individual and/or group projects using tolerances and fit up of metal products. Emphasis is placed on safety procedures in fabrication.

## **8079 Submerged Arc Welding 2**

Offers advanced study in arc welding, with emphasis on use and orientation of submerged arc welding equipment.

## **8090 Shielded Metal Arc Welding 1 5**

Covers welding in ferrous metals and alloys using shielded metal arc welding methods. Includes flat and horizontal positions and single-pass and multipass techniques. Gives attention to safety hazards and safe practices in arc welding

## **8095 Shielded Metal Arc Welding 2 5**

Demonstrates the welding of ferrous metals and alloys using shielded metal arc methods, single- and multipass techniques, and flat and horizontal positions. Emphasis is placed on safe practices.

## **8096 Gas Metal Arc (MIG) Welding 5**

Studies various gas metal arc welding (GMAW) processes, including microwire, flux-core, innershield, and submerged arc, with emphasis on metal inert gas welding. Demonstrates techniques of welding in all positions on various thicknesses of metal.

## **8097 Gas Tungsten Arc (TIG) Welding 5**

Provides extensive experience in gas tungsten arc welding. Demonstrates welds on various types and thicknesses of metal, using all welding positions.

## **8098 Welding Certification 4**

Prepares the student for certification in shielded arc, TIG, and MIG welding through study of the qualifications, procedures, and equipment standards. Includes a survey of qualifying agencies, associations, and societies.

## **8099 Oxyacetylene Welding and Cutting 5**

Offers basic instruction in oxyacetylene welding, with emphasis on welding techniques in flat, horizontal, vertical, and overhead positions. Also includes brazing and flame cutting. Attention is given to safety hazards and safe practices in oxyacetylene welding and cutting.

## General Education and Special Courses

- 8110 Communications** **4**  
 Helps the student to achieve competence in organizing and expressing ideas in writing.
- 8111 Business Communications** **4**  
 Develops communications skills for use in business and industry. Special attention is given to business correspondence and to problems in oral and written communication.
- 8113 Oral Communications** **4**  
 Focuses on the oral communication process as it applies to the workplace. Special attention is given to informative briefings, persuasive presentations, interviews, small conferences, and other job-related communication situations.
- 8114 Technical Reporting** **3**  
 Presents principles and methods of written and oral reporting. Includes the preparation of various types of reports, business letters, and memoranda.
- 8115 Critical Reading** **2**  
 Develops skills in comprehension and critical interpretation of college-level reading materials. Offers advanced study of implied and inferred meanings.
- 8116 Speed Reading** **2**  
 Increases reading speed while maintaining or improving comprehension. Demonstrates how to match reading speeds with objectives and types of material.
- 8117 Effective Listening** **2**  
 Focuses on the listening process. Discusses barriers to effective listening and provides exercises to overcome them.
- 8118 Effective Reading** **2**  
 Increases reading speed while maintaining or improving comprehension and retention. Analyzes the student's present reading ability and demonstrates techniques for improving efficiency.
- 8119 Copywriting** **4**  
 Studies techniques of effective copywriting as applied to magazine and newspaper advertising, including outdoor, transit, and direct response advertising. Covers the preparation of headlines and body copy and scripting for television and radio commercials. Also studies aspects of language relating to the behavioral sciences.
- 8120 College Study Principles** **2**  
 Helps the student to acquire successful study habits and to deal more effectively with college-level lectures and laboratory work.

- 8123 Total Communications - Manual 1** **4**
- Studies the use of the manual alphabet and the necessary expressive and receptive skills, body language, and facial and grammatic expressions for communication with the deaf. Attention is given to psychology of deafness.
- 8124 Vocational Technical Vocabulary for the Deaf** **4**
- Prepares the deaf student with the vocational, technical vocabulary needed for his or her specific program prior to entry in the program. Develops functional understanding and skills.
- 8125 Career Exploration** **1**
- Provides orientation and assistance in choosing a career. Explains and describes the wide range of occupational training programs offered by Ivy Tech.
- 8126 Personal Management Skills** **2**
- Designed to assist the deaf student who has completed schooling at a school for the deaf, but who has had no opportunity to develop independent living skills. Provides instruction in various aspects of independent living not previously encountered.
- 8127 Technical Vocabulary for the Deaf 1** **4**
- Provides the deaf student with a basic or core technical vocabulary for the study program of his or her choice.
- 8128 Technical Vocabulary for the Deaf 2** **4**
- Provides further instruction for the deaf student in technical vocabulary for the study program of his or her choice. Emphasis is placed on meanings and signs.
- 8129 Technical Vocabulary for the Deaf 3** **4**
- Provides further instruction for the deaf student in technical vocabulary for the study program of his or her choice.
- 8130 Technical Vocabulary for the Deaf 4** **4**
- Provides further instruction for the deaf student in technical vocabulary for the study program of his or her choice. Covers technical terms associated with advanced course work.
- 8131 Total Communications - Manual 2** **4**
- Provides further study in the use of the manual alphabet and the necessary expressive and receptive skills, body language, and facial and grammatic expressions for communication with the deaf.
- 8132 Effective Communication for the Hearing Impaired** **4**
- Offers solutions to various communication problems encountered by the deaf in job-seeking and on-the-job situations. Provides practice in interpersonal communications, information sharing, and persuasive argument.

**8133 Independent Living Skills** 4

Provides practical training for the deaf in basic independent living skills.

**8134 Independent Consumer Skills** 4

Offers practical training for the deaf in basic consumer skills.

**8135 Total Communications - Manual 3** 4

Provides further instruction in expressive, receptive, conversational, and presentational skills.

**8136 Business Terminology for the Deaf** 3

Studies business terminology relating to the deaf student's area of interest. Develops skills in the use of business terminology.

**8137 English Language Structure for the Deaf** 4

Establishes a foundation for succeeding communication courses.

**8151 Developmental Writing (Pre-Tech)** 3-4

Offers training in basic writing skills, with emphasis on sentence structure and basic grammar.

**8152 Developmental Reading 1 (Pre-Tech)** 2-4

Develops decoding, vocabulary, and comprehension skills. Aids in developing basic reading skills to the junior high school level.



**8153 Developmental Reading 2 (Pre-Tech)** 2-4

Develops vocabulary and comprehension to the high school level.

**8154 Developmental Reading 3 (Pre-Tech)** 2-4

Develops vocabulary and comprehension to college level.



- 8155 Intrapersonal Skills Development (Pre-Tech) 4**  
Offers strategies for improving the self-image, with emphasis placed on the student's personal strengths. Encourages increased self-direction.
- 8156 Study Skills Development (Pre-Tech) 2**  
Develops skills needed for success in classroom work. Includes techniques of taking lecture notes, reading textbooks, outlining, and taking tests.
- 8157 Communications Skills Development (Pre-Tech) 3**  
Develops vocabulary, grammar, and writing skills relevant to the student's chosen occupation.
- 8159 Improving Your Handwriting (Pre-Tech) 2**  
Improves the student's ability to write legibly. Includes individual diagnosis of penmanship faults, demonstration of handwriting techniques, and guided practice.
- 8160 Developmental Writing 2 (Pre-Tech) 4**  
Demonstrates how to apply the rules of grammar to written sentences and how to expand from single sentences to groups of sentences based upon a central idea.
- 8161 English as a Second Language 3**  
Develops English language skills and technical vocabulary relevant to the student's field of study. The course is designed for students whose first language is not English.
- 8162 Spelling (Pre-Tech) 2**  
Offers study and practice in spelling, with attention to rules and exceptions.
- 8163 Learning Development (Pre-Tech) 4**  
Offers comprehensive testing and diagnosis of the student's learning strengths and weaknesses. Provides intensive developmental training in basic learning skills.
- 8164 English as a Second Language - Level 1 4**  
Offers oral/aural exercises and drills in phrases and sentence structure for students who have had little exposure to English.
- 8165 English as a Second Language - Level 2 4**  
Offers oral/aural exercises and drills in conjunction with elementary reading and writing exercises. The course is designed for students who have had little exposure to English.
- 8166 English as a Second Language - Level 3 4**  
Offers practice in speaking and writing English. The course is designed for students who have some understanding of English.

**8167 Language Skills Development (Pre-Tech) 4**

Provides an intensive, highly individualized program in the perceptual and cognitive development necessary for growth in language skills.

**8168 Language Skills (Pre-Tech) 4**

Studies spelling, punctuation, word division, capitalization, and number and abbreviation styles. Develops automatic responses for office efficiency.

**8170 Developmental Speech (Pre-Tech) 4**

Develops basic communication skills.

**8201 Applied Mathematics 1 4**

Reviews basic mathematics required for technical fields, with emphasis on measurement, ratio, proportion, percentage, and formula evaluation.

**8202 Applied Mathematics 2 4**

Offers further study of basic mathematics, with emphasis on equations, squares, square roots, distances, areas, volumes, and right triangles.

**8203 Technical Mathematics 1 4**

Introduces algebra through linear equations in one unknown. Includes graphing, powers of ten, scientific notation, and the metric system.

**8204 Technical Mathematics 2 4**

Provides further study in basic mathematics, with emphasis on systems of equations. Includes fractional and quadratic equations, factoring, and logarithms.

**8206 Technical Calculus 1 4**

Introduces analytic geometry and differential and integral calculus.

**8207 Technical Calculus 2 4**

Offers further study in methods and applications of differential and integral calculus. Introduces differential equations.

**8208 Geometry 3**

Studies geometric topics relevant to modern technology, including fundamentals of geometry, polygons, solid geometry, properties of circles, constructions, and right triangles.

**8209 Trigonometry 3**

Studies trigonometric functions, use of trigonometric tables and scientific calculators, problems involving right triangles, oblique triangle trigonometry, and graphing of trigonometric functions.

**8210 Statistics 3**

Studies the collection, interpretation, and presentation of data, including meas-

ures of central tendency, binomial and normal distributions, hypothesis-testing, and probability.

### **8211 Computer Mathematics 2**

Studies mathematics relevant to solution and simplification of computer programs, including number bases, logic, and flowcharts.

### **8212 Business Mathematics 4**

Studies business practices pertaining to banking and retail sales, including reconciliation statements, invoicing, simple interest, payroll, and inventory. Introduces metrics and number bases other than ten.

### **8213 Mathematics of Finance 1 4**

Studies topics of interest to the business manager, including markup, commission, taxes, and compound interest. Introduces statistics, depreciation, and analysis of financial statements.

### **8214 Metric System 1**

Introduces the use of metrics, with emphasis on everyday applications.

### **8215 Electronic Calculator Mathematics 1**

Offers training in the use of a four-function calculator and/or scientific calculator.

### **8216 Commercial Art Mathematics 2**

Includes measurement, scaling, and mathematics pertaining to type specifications and space requirements in newspaper, magazine, and TV advertising.

### **8218 Mathematics of Finance 2 4**

Offers further study in topics of interest to the business manager, including markup, commission, taxes, and compound interest, statistics, depreciation, and analysis of financial statements.

### **8220 Metrics 3**

Explains the metric units commonly used by business and industry, and compares the metric and English systems. Demonstrates use of conversion tables to change from one system to the other.

### **8222 Trigonometry 2 3**

Provides extensive application of trigonometry to technological problems.

### **8223 Pre-Mathematics for Electronics 1 4**

Studies arithmetic operations of whole numbers, fractions, decimals, and their applications to electronics.

### **8224 Pre-Mathematics for Electronics 2 4**

Studies percentage, ratios, proportion, signed numbers, scientific notation, and their applications to electronics.

<b>8225 Pre-Mathematics for Electronics 3</b>	<b>4</b>
Studies elementary algebra and its application to electronics.	
<b>8226 Technical Mathematics 3</b>	<b>4</b>
Provides further study of equations, using determinants and matrices. Introduces computer number bases and Boolean algebra.	
<b>8227 Computer Math and Logic</b>	<b>4</b>
Studies arithmetic operations in binary, octal, and hexadecimal numeration systems and conversion from the decimal system.	
<b>8251 Arithmetic 1 (Pre-Tech)</b>	<b>2</b>
Studies arithmetic operations in whole numbers.	
<b>8252 Arithmetic 2 (Pre-Tech)</b>	<b>2</b>
Studies arithmetic operations in fractions.	
<b>8253 Arithmetic 3 (Pre-Tech)</b>	<b>2</b>
Studies arithmetic operations in decimals.	
<b>8254 Intermediate Arithmetic 1 (Pre-Tech)</b>	<b>2</b>
Studies percentage and its uses.	
<b>8255 Intermediate Arithmetic 2 (Pre-Tech)</b>	<b>2</b>
Studies ratios and proportions.	
<b>8256 Intermediate Arithmetic 3 (Pre-Tech)</b>	<b>2</b>
Studies measurement, including English and metric systems.	
<b>8257 Elementary Algebra (Pre-Tech)</b>	<b>3</b>
Introduces algebraic concepts, including signed numbers, expressions and terms, simple equations, and formulas.	
<b>8258 Elementary Geometry (Pre-Tech)</b>	<b>2</b>
Introduces concepts of plane and solid geometry.	
<b>8259 Elementary Trigonometry (Pre-Tech)</b>	<b>2</b>
Introduces plane trigonometry concepts, with emphasis on right triangle trigonometry.	
<b>8261 Occupational Mathematics 1 (Pre-Tech)</b>	<b>2</b>
Introduces mathematics applicable to the occupational area in which the student is enrolled.	

- 8262 Occupational Mathematics 2 (Pre-Tech)** **2**  
 Applies mathematics to specific problems typically found on the job.
- 8263 Developmental Mathematics 1 (Pre-Tech)** **2**  
 Covers whole numbers, fractions, and decimals
- 8264 Developmental Mathematics 2 (Pre-Tech)** **2**  
 Covers percentage, ratio and proportion, and the metric system.
- 8265 Mathematics Concepts (Pre-Tech)** **3**  
 Presents pre-algebraic concepts pertaining to numbering systems and operations in addition and subtraction, using fractions and decimals.
- 8266 Mathematical Skills (Pre-Tech)** **4**  
 Develops pre-algebraic skills pertaining to numbering systems and operations in addition and subtraction, using fractions and decimals.
- 8267 Mathematics for Business 1 (Pre-Tech)** **4**  
 Applies fundamentals of business mathematics to banking transactions and retail and wholesale sales. Covers interest, discounts, credit charges, commissions, and metric measurements.
- 8268 Mathematics for Business 2 (Pre-Tech)** **4**  
 Provides further study in business mathematics, emphasizing markup, payroll records, compound interest, depreciation, and financial statements.
- 8272 Mathematics Skills Development (Pre-Tech)** **4**  
 Develops premathematics and basic mathematics skills in accordance with the student's individualized education plan (IEP).
- 8273 Basic Mathematics Review (Pre-Tech)** **3**  
 Develops elementary mathematics skills at the student's pace in preparation for more advanced study. Includes review of whole numbers, fractions, and decimals.
- 8274 Ratio, Proportion, and Measurement (Pre-Tech)** **2**  
 Presents the numerical relationships expressed in ratios and proportions and their use in converting units of measure from English to metric or metric to English systems. Emphasis is placed on the use of formulas and the meanings of metric prefixes.
- 8275 College Algebra (Pre-Tech)** **4**  
 Introduces basic algebraic concepts needed to solve problems encountered in technical-vocational occupations. Included are operations with signed numbers, expressions, and terms; evaluation of simple equations and formulas; applications of graphing, and scientific notation.

- 8301 Physical Science** **3**  
Studies the sources and transformations of energy and the effects of the use of energy on the environment and human population.
- 8302 Mechanics** **3**  
Studies matter and its properties including force, equilibrium, stress, and motion. Introduces fluid statics and dynamics.
- 8303 Heat, Light and Sound** **3**  
Studies the technological use of heat, light, and sound as forms of energy. Emphasis is placed on the transfer of energy, the production of heat, and electromagnetic radiation.
- 8307 General Chemistry** **3**  
Studies the forms and reactions of matter, concepts of atomic structure, bonding, equilibrium, acid-base chemistry, solutions, and chemical calculations. Also introduces principles of organic chemistry and biochemistry.
- 8308 General Microbiology** **3**  
Introduces fundamentals of microbiology, with emphasis on types of microorganisms, their nutrition and metabolism, and their beneficial and harmful effects on man.
- 8350 Science Development in Physics (Pre-Tech)** **1**  
Assists the student in establishing a foundation for the technical curriculum through self-paced study of physical concepts.
- 8351 Science Development in Chemistry (Pre-Tech)** **1**  
Assists the student in establishing a foundation for the technical curriculum through self-paced study of chemistry concepts.
- 8352 Science Development in Biology (Pre-Tech)** **1**  
Assists the student in establishing a foundation for the technical curriculum through self-paced study of biological concepts.
- 8353 GED Science 1** **3**  
Studies concepts of physics, chemistry, and biology in a self-paced format in preparation for a technical curriculum.
- 8401 Human Relations** **4**  
Studies human behavior, motivation, and relationships and human aspects of the workplace.
- 8402 Applied Behavioral Psychology** **4**  
Helps students to discover and actualize unique capacities and personal strengths in themselves and others. Emphasis is placed on discovering, clarifying, and affirming individual potential for living more fully.

**8403 Psychology of Advertising 4**

Studies principles of psychology relevant to advertising, consumer roles and behavior, life styles, design and color concepts, motivation, and self-image.

**8404 Environmental Psychology 4**

Studies psychological concepts pertaining to the design of space and objects for human work, living, and leisure.

**8405 Social Problems 4**

Provides study and analysis of contemporary social problems. Examines urban life, technological advance, ecology, crime, drug abuse, overpopulation, and other social problems, with emphasis on their effects upon individual accomplishment and occupations.

**8406 Employment Orientation 2**

Investigates employment opportunities in the student's area of interest. Discusses occupational information and where to find it, interviews, and specific jobs and fields.

**8410 Social Development 3**

Aids in the development of social skills related to employment, job training, and job seeking.

**8414 Career Exploration 2**

Investigates career options based on the student's values, interests, and abilities. Provides the foundation for making a career choice.

**8417 Sociology 4**

Introduces definitions, theories, and concepts developed by sociologists to explain group behavior, structures, and processes.

**8418 Making It Count 3**

Introduces computers by means of a telecourse.

**8421 Developmental Psychology/ Life Cycle Development 4**

Introduces the study of social, emotional, and mental development. Includes theories of achievement and adjustment.

**8423 Sociology 4**

Introduces principles and concepts of modern sociology. Focuses on the social organization, individuals, and groups in society, social institutions, and social change.

**8425 Contemporary Health Issues 3**

Explores contemporary issues in American health through interviews with health care experts and lay persons. Topics include the status of health in America, the meaning of health in a changing environment, current health hazards, self-inflicted disease, and acquiring and using health knowledge.

**8451 Orientation to the World of Work (Pre-Tech) 2**

Examines the mental and social adjustments and educational and vocational preparation necessary for success in the job market.

**8452 Abnormal Psychology 4**

Deals with biological, psychological, and sociocultural aspects of maladaptive behavior. Discusses clinical definitions, therapeutic intervention, assessment techniques, and prevention of maladaptive behavior patterns. Includes study of transient stress reactions, neurotic patterns, physical illness related to psychological factors, personality disorders, schizophrenia, paranoia, and behavioral disorders of childhood and adolescence.

**8501 Field Study/Cooperative Education 1-15**

Provides opportunity for a field project or research case study within the student's occupational specialty. The project or study will include collection and analysis of data and actual work experience in business or industry.

**8551 Tutorial Assistance Laboratory 1-15**

Offers opportunity for extended practice in skills specifically related to one or more courses.

**9305 Technical Mathematics for Health Occupations 5**

Offers basic instruction in technical mathematics for students in health occupations. Includes review of arithmetic, basic concepts of algebra, graphing geometry, and logarithms.

**9306 Health Careers Mathematics 3-5**

Presents fundamentals of mathematics in preparation for subsequent courses in the health occupations. Includes arithmetic, exponents, directed numbers, arithmetic operations using scientific notation, Roman numerals, metric conversions, apothecaries and household systems of measurement, centigrade and Fahrenheit conversions, simple equations, and the construction and interpretation of graphs.

**9307 Health Careers Biology 1 2**

Introduces fundamental concepts of biology, including organization, cell structure, and respiratory processes.

**9308 Health Careers Biology 2 2**

Introduces concepts of biology pertaining to cellular control mechanisms, with emphasis on processes of protein synthesis, gene control, development, differentiation, reproduction, basic genetics, and cybernetic systems.

**9310 Pharmacology 4**

Discusses commonly used medications and their effects on the body. Emphasis is placed on clarification, uses, routes of administration, dosages, interactions, incompatibilities, and side effects. Attention is given to special precautions, legal aspects, and patient education.



### **9311 Mathematics for Pharmacology** **2**

Presents principles of computation as used in the administration of drugs.

### **9312 Health Careers Chemistry** **3**

Introduces in a 4-week module the basics of chemistry, including atomic and molecular concepts and a description of solutions by different means, such as percent by weight. Also includes equilibrium systems, with emphasis on acids, bases, and buffer systems.

### **9313 Health Career Chemistry** **3**

Introduces allied health students to the basics of chemistry and related physics. Includes basic mathematics for chemistry; measurement methods for weights and volumes of materials and solutions; fundamental laws and concepts concerning matter, energy, and the atom; physical laws pertaining to force, pressure, and fields; chemical bonds; chemical nomenclature; stoichiometry; oxidation reduction; and electrochemistry. Provides opportunities for each student to study and operate one type of clinical laboratory instrument.

### **9315 Nurse Aide Procedures and Practicum 1** **6**

Trains nurses' aides and orderlies to perform specific duties under the direct supervision of the professional nurse. Covers care of the patient unit, personal care of the patient, vital signs, admission procedures, nutrition and patient safety, nursing in specific disease conditions, employment practices and procedures, and clinical experience.

### **9322 Biophysics for the Health Occupations** **2**

Studies basic concepts of physics and their applications in the health field. Emphasis is placed on problem solving and practical applications of theoretical material.

### **9324 Arts and Practices for Nurse Aide/Orderlies** **6**

Prepares nurses' aides and orderlies to become members of the medical team at health care institutions. Emphasis is placed on development of professional attitudes and skills.

### **9326 Health Careers Chemistry Laboratory** **1**

Develops laboratory competencies needed for preprogram entry level in the health occupations.

### **9327 Nurse Aide Procedures** **6**

Trains nurses' aides and orderlies to perform specific duties under the direct supervision of the professional nurse. Covers care of the patient unit, personal care of the patient, vital signs, admission procedures, nutrition and patient safety, nursing in specific disease conditions, employment practices and procedures, and clinical experience.

### **9328 Nurse Aide and Orderly** **9**

Prepares nurses aides and orderlies to become members of the medical team at

health care institutions. Emphasis is placed on development of professional attitudes and skills.

### **9330 Survey of Anatomy and Physiology 2**

Studies the human body as an integrated unit. Includes anatomy, physiology, medical terminology, common diseases, and applications of physics, chemistry and microbiology.

### **9331 Medical Terminology for Nurse Aide 2**

Includes nomenclature pertaining to nursing procedures, diagnosis, diseases and their causes, abnormalities, injuries, surgical procedures, hospital departments, equipment, and titles of health care personnel.

### **9332 Mathematics for Nurse Aide 5**

Presents fundamentals of mathematics as applied to health care.

### **9333 Pharmacology and Medication Administration for Unlicensed Personnel 5**

Trains nurses aides employed in nursing homes in the safe administration of oral drugs. Also includes study of common diseases.

### **9336 Pharmacology 1 2**

Studies methods of administering drugs, correct dosages, symptoms of overdose, and abnormal reactions arising from individual differences in patients.

### **9337 Pharmacology 2 2**

Provides further study in methods of drug administration, including correct dosages, symptoms of overdose, and abnormal reactions arising from individual differences in patients.

### **9338 Unit Clerk Medical Records 4**

Instructs in the duties of the unit clerk, emphasizing the maintenance of patient records. Explains the uses and purposes of medical charts and demonstrates the preparation and maintenance of a chart during a patient's hospitalization. Attention is given also to the legal responsibilities of the unit clerk.

### **9342 Advanced Pharmacology for the Qualified Medication Aide (QMA) 1**

Offers continuing education for the qualified medication aide (QMA), with emphasis on the administration of medication to the elderly.

### **9349 Anatomy and Physiology 8**

Studies the human body as an integrated unit. Includes anatomy, physiology, medical terminology, common diseases, and applications of physics, chemistry and microbiology.

### **9350 Medical Law and Ethics 2**

Studies the ethics of medicine and medical practice, with attention to the legal requirements and implications for professional and medical practices and personnel.

- 9351 Human Anatomy** 4
- Studies the location of the major tissues and organs of the human body. Introduces medical and directional terms used to describe body structure and planes. Provides a basic knowledge of anatomy, enabling the student to place more specialized studies of the structural units in larger perspective.
- 9352 Physiology** 4
- Studies the nervous, muscular, cardiovascular, respiratory, digestive, urinary, endocrine, and reproductive systems and their functions with regard to the body as a whole.
- 9353 Anatomy and Physiology 1** 4
- Studies the human body as an integrated unit. Includes anatomy, physiology, medical terminology, common diseases, and applications of physics, chemistry and microbiology.
- 9354 Anatomy and Physiology 2** 4
- Provides further study in the human body as an integrated unit. Includes anatomy, physiology, medical terminology, common diseases, and applications of physics, chemistry and microbiology.
- 9355 Medical Terminology** 4
- Presents basic terminology required of all paraprofessionals in the health occupations. Also includes terminology specific to the student's area of specialization.
- 9356 Disease Conditions** 6
- Presents basic concepts concerning disease, its causes, and the resulting changes in body functions. Emphasis is placed on functional disturbances and the correlation of patient symptoms with emergency and in-patient treatment.
- 9357 Advanced Medical Terminology** 4
- Offers advanced study of medical terminology, with emphasis on diseases, conditions, and treatments. Attention is given to derivatives and applications of medical terms, symbols, and signs.
- 9358 Pharmacology** 3
- Introduces the principles of pharmacology. Studies classifications of drugs, dosages, interactions, and incompatibilities. Covers drug administration, weights and measurements, and methods of preparation, with attention to legal aspects and special precautions.
- 9359 Cardiopulmonary Resuscitation** 1
- Develops proficiency in mouth-to-mouth, mouth-to-nose, and mouth-to-stoma breathing.

**9365 Chemical Dependency 4**

Introduces studies of chemical dependency, including commonly abused drugs, effects and symptoms of withdrawal, and treatment alternatives.

**9375 Refresher Medicine for Qualified Medication Aide (QMA) 1**

Offers review for qualified medication aides who wish to renew their credentials.

**9411 Mechanical Drawing 1 3**

Introduces fundamentals of drafting, including interpretation of lines, view positions, conventions and standard signs, symbols and abbreviations, use of instruments, simple geometric constructions, orthographic projections, scaling, and dimensioning.

**9412 Shop Mathematics 3**

Reviews addition, subtraction, multiplication, and division of whole and mixed numbers, fractions, decimals and percentages. Emphasis is placed on applications to industrial shop problems.

**9413 Building Trades Blueprint Reading 1 3**

Studies the interpretation of signs, symbols, dimensions, and abbreviations used in construction blueprints.

**9414 Blueprint Reading 1 3**

Studies the interpretation of working drawings and application of blueprint information to the working part. Includes study of views, details, dimensions, signs, and symbols.

**9416 Basic Diemaking 1 4**

Introduces theory, details, and techniques of stamping dies. Provides training in various cutting and forming operations.

**9417 Advanced Diemaking 1 4**

Includes progressive compound and inverted dies, die-to-press relationships, and automatic feeds.

**9418 Industrial Electrical Blueprint Reading 3**

Studies the interpretation of working schematics and blueprints pertaining to control circuits and industrial feed circuits commonly used in industrial machinery.

**9419 Basic Molding 4**

Studies the composition and characteristics of various plastic materials, compression factors, transfer and injection molds and their components, heating and cooling principles, and applications.

**9421 Shop Mathematics 2 3**

Covers linear and square measure, volumes, square roots, ratios and proportions, and introduces algebraic functions, sine numbers, grouping, and axioms. Emphasis is placed on practical applications to shop problems.

- 9422 Building Trades Blueprint Reading 2** **3**  
Offers in-depth study of building construction blueprints. Special emphasis is placed on commercial construction techniques, both general and mechanical.
- 9423 Blueprint Reading 2** **3**  
Studies more complicated blueprints for mechanical parts, machines, and tools. Emphasis is placed on relationship of print to the working piece.
- 9424 Mathematics for Blueprint Reading 2** **4**  
Covers linear and square measures, volumes, square roots, ratios, and proportions, and introduces algebraic functions, sine numbers, grouping, and axioms. Includes study of mechanical blueprints and their relationship to the working piece. Also includes reading of more complicated prints for parts, simple machines and tools.
- 9425 Basic Diemaking 2** **4**  
Studies primary die components, including punches, punch plates, die blocks and strippers, and their functions.
- 9426 Advanced Diemaking 2** **4**  
Demonstrates the fabrication of more elaborate and complicated dies. Includes study of dieforms, draw dies, secondary operations, trim, notch, and shear dies.
- 9428 Machine Operator Shop Mathematics 1** **3**  
Studies common and large fractions as used by the machine operator.
- 9429 Machine Operator Shop Mathematics 2** **3**  
Studies decimal fractions as used specifically in micrometer measurement.
- 9431 Shop Mathematics 3** **3**  
Covers addition, subtraction, multiplication, and division of monomials and polynomials, equations, factoring, fractions, fractional and literal equations, exponents and radicals, linear equations, and quadratics.
- 9432 Blueprint Reading 3** **3**  
Studies reading of electrical blueprints and schematics, with attention to signs, symbols, and abbreviations.
- 9441 Shop Mathematics 4** **3**  
Studies geometrical terms, axioms, theorems, and propositions pertaining to straight lines, triangles, and circles. Emphasis is placed on practical applications to shop problems.
- 9450 Shop Mathematics 5** **3**  
Presents definitions of the trigonometric functions, construction and use of tables, interpolation solutions of right triangles, and applications of trigonometry to practical shop problems. Also includes computations made with legs and functions of the angles.

**9460 Mathematics 6** **3**

Studies obliques, using the altitude construction method; laws of sines, cosines, and cotangents; angle formula; and tangent law. Emphasis is placed on applications to shop design problems.

**9470 Review of Pre-apprenticeship** **3**

Reviews basic skills needed for entry level apprenticeship training.

**9472 Computer Programming for Technicians**

This course provides a general introduction to computer programming and programming applications for technicians employed in any of the following industrial work settings: design, engineering, manufacturing, and technical service.

**9475 Robotics Fundamentals** **4**

Studies differences between pararobots and robots; uses and functions of robots; relationships of robotics to hydraulics, pneumatics, and electronics; and factors affecting robotic systems. Also covers robotics maintenance, control devices, microprocessor operation, data acquisition systems, and basic data handline and conversion system.

**9476 Advanced Robotics** **4**

Provides further study in robotics, uses and functions of robots; relationships of robotics to hydraulics, pneumatics, and electronics; and factors affecting robotic systems. Also covers robotics maintenance, control devices, microprocessor operation, data acquisition systems, and basic data handline and conversion system.

**9481 Fluid Power 1** **3**

Introduces the technology of hydraulics and pneumatics. Includes basic concepts, terminology, principles, functions, and applications of components. Emphasis is placed on hydraulic symbols and system circuits.

**9482 Fluid Power 2** **3**

Pertains specifically to hydraulics. Includes study of component operation and the relationships and interactions of system elements.

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**ACCREDITATIONS AND MEMBERSHIPS**

Indiana Vocational Technical College is accredited by the North Central Association of Colleges and Schools, the State Board of Vocational Technical Education, and other agencies as listed below by region. The College is a member of the American Association of Collegiate Registrars and Admissions Officers, the American Association of Community and Junior Colleges, the Association of Community College Trustees, and the National Association of College and University Business Officers.

**Accrediting Agencies and Affiliations**

<b>Region</b>	<b>Agency</b>	<b>Program Area</b>
1	North Central Association of Colleges and Schools	All
	State Board of Vocational and Technical Education	All
	Northwest Indiana Chef's Association	Culinary Arts
	The American Culinary Federation Inc.	Culinary Arts
	U.S. Department of Labor	Culinary Arts
	Joint Review Committee on Respiratory Therapy Education	Respiratory Therapy Technician
	Joint Review Committee on Education for the Surgical Technologist	Surgical Technician
	American Assn. of Medical Assistants	Medical Assistant
	Indiana State Board of Nurses' Registration and Nursing Education	Practical Nursing
2	North Central Association of Colleges and Schools	All
	State Board of Vocational and Technical Education	All
	American Assn. of Medical Assistants	Medical Assistant
	National Accrediting Agency for Clinical Laboratory Sciences	Medical Lab Technician
	Indiana State Board of Nurses' Registration and Nursing Education	Practical Nursing
3	North Central Association of Colleges and Schools	All

	State Board of Vocational and Technical Education	All
	American Assn. of Medical Assistants	Medical Assistant
	Hospital, Institution, and Educational Food Service Society	Dietary Manager
	Joint Review Committee for Respiratory Therapy Education	Respiratory Therapy Technician
	Indiana State Board of Nurses' Registration and Nursing Education	Practical Nursing
	American Dietetic Association	Dietary Manager
4	North Central Association of Colleges and Schools	All
	State Board of Vocational and Technical Education	All
	Indiana State Board of Nurses' Registration and Nursing Education	Associate Degree Nursing, and Practical Nursing
	National Accrediting Agency for Clinical Laboratory Sciences	Medical Lab Technician
	American Assn. of Medical Assistants	Medical Assistant
	Association of Surgical Technologists	Surgical Technician
	Joint Review Committee on Respiratory Therapy	Respiratory Therapy Technician
	American Dental Association	Dental Assistant
5	North Central Association of Colleges and Schools	All
	State Board of Vocational and Technical Education	All
	American Assn. of Medical Assistants	Medical Assistant
6	North Central Association of Colleges and Schools	All
	State Board of Vocational and Technical Education	All
	American Assn. of Medical Assistants	Medical Assistant
	Council for Standards and Human Services	Mental Health Rehabilitation
7	North Central Association of Colleges and Schools	All
	State Board of Vocational and Technical Education	All
	National Accrediting Agency for Clinical Laboratory Sciences, Committee on Allied Health Education and Accreditation	Medical Lab Technician
	Joint Review Committee on Education and Radiologic Technology, Committee on Allied Health Education and Accreditation	Radiologic Technology
	Indiana State Board of Nurses' Registration and Nursing Education	Practical Nursing

	American Assn. of Medical Assistants, Committee on Allied Health Education and Accreditation	Medical Assistant
8	North Central Association of Colleges and Schools	All
	State Board of Vocational and Technical Education	All
	National Accrediting Agency for Clinical Laboratory Sciences	Medical Lab Technician
	American Assn. of Medical Assistants	Medical Assistant
	Assn. of Surgical Technologists, Inc.	Surgical Technician
	American Society of Radiologic Technologists	Radiologic Technology
	Joint Review Committee on Respiratory Therapy Education	Respiratory Therapy Technician
	Indiana State Board of Nurses' Registration and Nursing Education	Practical Nursing
	National League of Nursing	Practical Nursing
	American Institute for Design and Drafting	Industrial Drafting Technology, and Architectural Drafting Technology
	Indiana Department of Instruction	Qualified Medication Aide, and Home Health Aide
	Indiana Emergency Medical Services Commissions	Emergency Medical Technician
	American Culinary Federation Inc.	Culinary Arts
	Chef de Cuisine Association of Indiana, Inc.	Culinary Arts
9	North Central Association of Colleges and Schools	All
	State Board of Vocational and Technical Education	All
	Indiana State Board of Nurses' Registration and Nursing Education	Practical Nursing
	National Accrediting Agency for Clinical Laboratory Sciences	Medical Lab Technician
	Emergency Medical Services Commission	Emergency Medical Technician
	Indiana State Board of Health	Home Health Aides
10	North Central Association of Colleges and Schools	All
	State Board of Vocational and Technical Education	All
	Joint Review Committee on Respiratory Therapy Education	Respiratory Therapy Technician
	Indiana State Board of Nurses' Registration and Nursing Education	Practical Nursing

11	North Central Association of Colleges and Schools	All
	State Board of Vocational and Technical Education	All
	Indiana State Board of Nurses' Registration and Nursing Education	Practical Nursing
	American Assn. of Medical Assistants	Medical Assistant
12	North Central Association of Colleges and Schools	All
	State Board of Vocational and Technical Education	All
	American Assn. of Medical Assistants	Medical Assistant
13	North Central Association of Colleges and Schools	All
	State Board of Vocational and Technical Education	All
	Indiana State Board of Nurses' Registration and Nursing Education	Practical Nursing
	American Assn. of Medical Assistants	Medical Assistant

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